



PUBLIC VERSION

**UNITED STATES INTERNATIONAL TRADE COMMISSION
Washington, D.C.**

In the Matter of)

CERTAIN DIGITAL SATELLITE)
SYSTEM (DSS) RECEIVERS)
AND COMPONENTS THEREOF)

Investigation No. 337-TA-392 '97

OCT 31 P2:17

OFFICE OF THE SECRETARY
U.S. INTERNATIONAL TRADE COMMISSION

**Initial and Recommended Determinations
Paul J. Luckern, Administrative Law Judge**

Pursuant to the Notice of Investigation (61 Fed. Reg. 66695-96 (December 18, 1996)), this is the administrative law judge's initial final determination, under Commission rule 210.42(a)(1)(i). The administrative law judge hereby determines, after a review of the record developed, that there is no violation of subsection (a)(1)(B)(i) of the Tariff Act of 1930, as amended (19 U.S.C. § 1337) (section 337), in the importation into the United States, the sale for importation, or the sale within the United States after importation, of certain digital satellite (DSS) receivers and components thereof.

This is also the administrative law judge's recommended determination on issues concerning permanent relief and bonding under Commission rule 210.42(a)(1)(ii) in the event that the Commission finds a violation of section 337.

The staff argued that "there is a question as to whether the television receiver of paragraph one [of claim 44] is the same as the mass medium receiver of paragraph three" and that the use of the differing terms and the separation of the features into different sections of the claim suggest that there are two distinct receivers. (SBr. at 35).

Each of the parties agree that the phrase "television receiver" as used in claim 44 refers to the receiver portion of a television set. The specification of the '277 patent contains the following regarding a commercially available television tuner:

FIG. 1 shows a video/computer combined medium subscriber station. Via conventional antenna, the station receives a conventional television broadcast transmission at television tuner, 215. The Model CV510 Electronic TV Tuner of the Zenith Radio Corporation of Chicago, Ill., which is a component of the Zenith Video Hi-Tech Component TV system, is one such tuner. This tuner outputs conventional audio and composite video transmissions. The audio transmission is inputted to TV monitor, 202M.

(CX 2, col. 12, lns. 52-61). In addition, the '277 specification discloses a system that includes a television receiver that is capable of receiving a "selected television transmission," (i.e., one of many television channels), and transferring television programming in that transmission, such as a particular television show, to a television display. (CX 2, '277 patent at col. 235, ln. 52 - col. 237, ln. 5). See e.g. CFF 380-381, BRRFF at 203.

Accordingly, based on the language of claim 44, and the '277 specification, the administrative law judge construes the phrase "television receiver" as used in claim 44 as directed to a tuner that outputs conventional audio and composite video transmissions, such as the receiver portion of a commercially available television set.

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ABBREVIATIONS

CBr	Complainant's Post Hearing Brief
CDX	Complainant's Demonstrative Exhibit
CPX	Complainant's Physical Exhibit
CFF	Complainant's Proposed Finding of Fact
CRBr	Complainant's Reply Brief
CRFF	Complainant's Proposed Rebuttal Finding of Fact
CX	Complainant's Exhibit
BR	Broadcasting Respondents
BRBr	Broadcasting Respondents' Post Hearing Brief
BRFF	Broadcasting Respondents' Proposed Finding of Fact
BRO	Broadcasting Respondents' Objections to Complainant's Finding of Fact
BRRFF	Broadcasting Respondents' Proposed Rebuttal to Complainant's Finding of Fact
BRRBr	Broadcasting Respondents' Reply Brief
MR	Manufacturing Respondents
MRBr	Manufacturing Respondents' Post Hearing Brief
MRFF	Manufacturing Respondents' Proposed Finding of Fact
MRO	Manufacturing Respondents' Objections to Complainant's Finding of Fact
MRRBr	Manufacturing Respondents' Reply Brief
MRRFF	Manufacturing Respondents' Proposed Rebuttal Finding of Fact
RX	Respondents' Exhibit
RDX	Respondents' Demonstrative Exhibit
RPX	Respondents' Physical Exhibit
SBr	Staff's Post Hearing Brief
SFF	Staff's Proposed Finding of Fact
SRBr	Staff's Reply Brief
SRFF	Staff's Proposed Rebuttal Finding of Fact
FF	Finding of Fact
Tr	Transcript of Hearing Including Closing Arguments

PROCEDURAL HISTORY

By notice, which issued on December 11, 1996, the Commission instituted an investigation, pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, to determine whether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain digital satellite system (DDS) receivers and components thereof by reason of infringement of claims 3, 6, 7, 12, 15, 35 or 44 of U.S. Letters Patent 5,335,277 (the '277 patent), and whether there exists an industry in the United States as required by subsection (a)(2) of section 337.¹ The notice of investigation was published in the Federal Register on December 18, 1996. (61 Fed. Reg. 66695-96).²

The named complainant in this investigation is Personalized Media Communications, L.L.C. (PMC) of New York City. The named respondents are Thomson Consumer Electronics, Inc. (Thomson or TCE), Toshiba America Consumer Productions, Inc. (Toshiba) and Matsushita Electric Corporation of America (Matsushita) and also DIRECTV, Inc. (DIRECTV), United States Satellite Broadcasting Company, Inc. (USSB), Hughes Network Systems (HNS) and Hitachi Home Electronics (America) Inc. (Hitachi).³

¹ The notice was based on a complaint filed on November 13, 1996, which complaint was supplemented by letters dated November 25 and December 2, 1996.

² Complainant and respondents filed a "Stipulation and Order for Stay" in the United States District Court, Northern District of California (Civil Action No. C-96 20857 SW (EAI)) on January 9, 1997 whereby it was stipulated and agreed that all proceedings in said civil action be stayed upon the district court's entry of any order approving the stipulation and enforcing its terms and that should a determination in this investigation become final, any party may apply to the district court for an order terminating said stay forthwith.

³ In these initial and recommended determinations, Thomson, Toshiba and Matsushita are collectively referred to as the "manufacturing respondents" while DIRECTV, USSB, HNS and Hitachi are collectively referred to as the "broadcasting respondents."

Order No. 3 set a target date of December 18, 1997. Order No. 30 extended the target date to January 19, 1998.

Order No. 40 (an initial determination) granted complainant's motion to delete from the investigation claims 3, 12, and 15 of the '277 patent. On May 27, 1997, the Commission determined not to review said order.

Order No. 50 (an initial determination) granted the broadcasting respondents' motion for summary determination that claim 35 of the '277 patent was anticipated by a prior art reference and therefore invalid under 35 U.S.C. § 102(b). On June 18, 1997, the Commission determined not to review said initial determination.⁴ Accordingly in issue in this investigation are claims 6, 7 and 44 of the '277 patent.

The evidentiary hearing in this investigation began on June 30, 1997, lasted ten hearing days, and was completed on July 12, 1997. Following the filing of post-hearing submissions, closing arguments were heard on August 22, 1997.

The matter is now ready for a decision.

These initial and recommended determinations are based on the record compiled at the hearing and the exhibits admitted into evidence. The administrative law judge has also taken into account his observation of the witnesses who appeared before him during the hearing. Proposed findings submitted by the parties not herein adopted, in the form submitted or in substance, are rejected as either not supported by the evidence or as involving immaterial matter and/or as irrelevant. The findings of fact included herein have references to

⁴ On August 15, 1997, complainant petitioned the United States Court of Appeals for the Federal Circuit for review of the Commission's determination not to review Order No. 50.

supporting evidence in the record. Such references are intended to serve as guides to the testimony and exhibits supporting the findings of fact. They do not necessarily represent complete summaries of the evidence supporting said findings.

OPINION ON VIOLATION

I Parties

See FF 1-15,

II Jurisdiction

Each of the respondents responded to the complaint and notice of investigation and participated in the investigation. Thus, the administrative law judge finds that the respondents submitted to the personal jurisdiction of the Commission.

It is undisputed that the accused DSS receivers and components thereof are manufactured by HNS and TCE in Mexico, imported into the United States, and sold after importation by HNS, TCE, Hitachi, Matsushita, Toshiba, and DIRECTV. See CX 40. See also FF 412 to 420. Accordingly, the administrative law judge finds that the Commission has in rem jurisdiction over the products at issue.

The broadcasting respondents argued that "because the importation of the DSS receivers does not fulfill the importation requirement of the current version of § 1337(a)(1)(B) (section 337), with respect to DIRECTV or USSB, complainant has failed to meet the statutory requirements necessary under that provision."⁵ Respondents argued that the broadcast signal of DIRECTV and USSB "indisputably does not come within" section

⁵ The broadcasting respondents' argument regarding respondent DIRECTV is not understood as undisputed evidence of record indicates that DIRECTV has sold in the United States after importation accused DSS receivers under the RCA brand name to at least AT&T (FF 420).

337(a)(1)(B). Hence, it is argued that DIRECTV's and USSB's actions cannot be unfair practices in import trade under 19 U.S.C. § 1337(a)(1)(B). (BRRBr at 33 to 35).⁶

Complainant argued that the nexus between the conduct of USSB and DIRECTV which constitutes direct infringement, contributory infringement and/or inducement to infringe is sufficient to bring their actions and DBS signals within the broad reach of section 337; and that Commission precedent firmly establishes that all that is required is some nexus between unfair methods or acts and importation for this Commission to have power to act. (CBr at 8, 9).

The staff argued that, while the broadcasting respondents argued that they cannot be found to have violated section 337 as a result of their "satellite broadcasting activities," this issue has already been resolved by the administrative law judge in his Order No. 53 (May 20, 1997) which denied said respondents' Motion No. 392-25 for summary determination that satellite broadcasts can not be unfair practices in import trade under section 337; and that the broadcasting respondents have failed to present any additional justification to exclude such activities from the reach of section 337. (SRBr at 32-36).

The Commission has previously held that the scope of section 337 is "broad enough to prevent every type and form of unfair practice." See Certain Welded Stainless Steel Pipe and Tube, Inv. No. 337-TA-29, USITC Pub. 863, Opinion of Commissioners Minchew, Moore and Alberger at 39 (1978) (Steel Pipe), quoting S. Rep. 595, 67th Cong., 2d Sess., at 3; and Certain Devices for Connecting Computers via Telephone Lines, Inv. 337-TA-360,

⁶ The manufacturing respondents adopted the arguments of the broadcasting respondents (MRRBr at 1).

Comm'n Op. at 13-14 (December 12, 1994) (Telephone Lines) ("the legislative history does make clear . . . the broad scope permitted for section 337 remedial orders."). The

Commission's remedial authority under section 337 is:

not limited to proscribing only those acts which occur during the actual physical process of importation. . . . Congress intended section 337 to attack only unfair trade practices which relate to imported products. It then becomes crucial to discern some nexus between unfair methods or acts and importation before this Commission has power to act.

Steel Pipe at 11. Moreover, in Certain Large Video Matrix Display Systems and Components Thereof, Inv. No. 337-TA-75, Order No. 14 at 2-3 (June 30, 1980) (Video Matrix), the administrative law judge denied respondent Milwaukee Brewers' motion for termination where the Brewers argued that they were not involved in the importation of the article at issue, finding that, as the domestic purchaser of a large imported scoreboard, respondents had:

direct involvement . . . in the importation of this scoreboard. This involvement alone supports their accountability under Section 337 as "importers," regardless of any ownership rights they may have in the scoreboard. . . . The Brewers, furthermore, do have a continuing property interest and commercial and operational obligations with respect to this scoreboard.

Id. at 2. In addition, the Commission has the remedial authority to issue cease and desist orders directed to purely domestic activities. See Certain Compound Action Metal Cutting Snips and Components Thereof, Inv. No. 337-TA-197, Commission Action and Order (July 19, 1985) (Cutting Snips) (issuing cease and desist orders prohibiting domestic respondents from passing off in United States) and Certain Apparatus for Installing Electrical Lines and Components Therefor, Inv. No. 337-TA-196, Commission Opinion at 16 and n.24 (June 20, 1986) (Electrical Lines) (issuing cease and desist order prohibiting false advertising or

passing off in the United States); Certain Plastic Food Storage Containers, Inv. No. 337-TA 152, Commission Action and Order at 10-11 (July 13, 1984) (Food Storage) (issuing cease and desist order prohibiting representations in the United States concerning interchangeability with complainant's product).

The Commission's statements in Cutting Snips, Food Storage, Steel Pipe, Video Matrix, Electrical Lines, and Telephone Lines regarding the scope of section 337 were made in relation to the earlier version of section 337(a) that provided that "[u]nfair methods of competition and unfair acts in the importation of articles into the United States, or in their sale by the owner, importer, consignee, or agent of either, . . . are declared unlawful . . ." 19 U.S.C. § 1337(a) (1980). However, the current version of section 337(a) was adopted in Pub.L. 100-418, and included a finding by Congress that:

the existing protection under section 337 of the Tariff Act of 1930 against unfair trade practices . . . has not provided United States owners of intellectual property rights with adequate protection against foreign companies violating such rights.

. . . . The purpose of this part is to amend section 337 of the Tariff Act of 1930 to make it a more effective remedy for the protection of United States intellectual property rights.

Pub.L. 100-418, § 1341, 19 USCA §1337 (1996 Supp.). During consideration of the 1988 amendments, Congress noted that the predecessor version of section 337 "was designed to cover a broad range of unfair acts" and that the purpose of the amendments was "to strengthen the effectiveness of section 337 in addressing the growing problems being faced by U.S. companies from the importation of articles which infringe U.S. intellectual property rights," S. Rep. 100-71, 100th Cong., 1st Sess., at 128. Moreover, the Conference Report

to Accompany H.R. 3, H.R. Rep. No. 100-576 at 633 (April 20, 1988) states, in relation to the change in the "importation" language of section 337:

In changing the wording with respect to importation or sale, the conferees do not intend to change the interpretation or implementation of current law as it applies to the importation or sale of articles that infringe certain U.S. intellectual property rights.

Id.⁷ Thus, contrary to the arguments by the broadcasting respondents that the current version of section 337 should be given a narrower interpretation than that given to the prior version of section 337 (BRRBr at 34-35), the administrative law judge finds that the 1988 amendments to section 337 were intended to make section 337 a "more effective remedy" for the protection of rights, including the rights of a patentee, and that statements made by the Commission prior to the 1988 amendments are applicable to the current section 337(a)(1)(B).

See e.g. Certain Hardware Logic Emulation Systems and Components Thereof, Inv. No. 337-TA-383, Unreviewed Initial Determination at 189 (Aug. 1, 1997) (Hardware).

With respect to the alleged unfair act, the broadcasting respondents have admitted that:

A typical subscriber must obtain the required DSS equipment . . . and then subscribe to one of several program packages offered. The subscribers pay a monthly fee to DIRECTV and/or USSB dependent on the type of package purchased. At present, DIRECTV and USSB combined have in excess of 2.5 million subscribers.

See Motion No. 392-25 at 5 (emphasis added) (citations omitted) and referenced in Order No. 53 at 9. Moreover, pursuant to a July 28, 1997 stipulation between complainant and the

⁷ The relevant language of section 337 was changed from a prohibition against "importation of articles into the United States, or in their sale by the owner, importer, consignee, or agent" to prohibit "the importation into the United States, the sale for importation, or the sale within the United States after importation by the owner, importer, or consignee of articles."

broadcasting respondents, DIRECTV and USSB have stipulated that their marketing and sales activities shall be considered active inducement should the Commission find direct infringement by the DSS receivers. (BRRBr at 31).

Based on the foregoing, the administrative law judge finds that complainant has established the requisite nexus between the activities of DIRECTV and USSB, and the importation of accused DSS receivers, such that DIRECTV's and USSB's actions can be unfair practices in import trade under 19 U.S.C. § 1337(a)(1)(B). Thus, he finds that the complaint, as supplemented, does state a cause of action under section 337, with respect to DIRECTV and USSB.

III Complainant Has Established A Domestic Industry

Complainant argued that it has satisfied the domestic industry requirement of section 337 through its substantial investment in the exploitation of the '277 patent in the United States. (CBR at 69).

The broadcasting respondents argued that complainant has failed to prove that it has made substantial investments in licensing the '277 patent, or that articles are produced pursuant to the '277 patent, and therefore no domestic industry exists. (BRBr at 122).⁸

The staff submitted that complainant's licensing activities satisfy the domestic industry requirement. (SBr at 4 to 10).

Subsection (a)(2) of section 337 provides that a violation of section 337 may be found only where a domestic industry exists or is in the process of being established with respect to

⁸ The manufacturing respondents have adopted the arguments of the broadcasting respondent (MRRBr at 1).

the articles protected by the patent, 19 U.S.C. § 1337(a)(2) (1994). Congress, in subsection (a)(3) of section 337, has set forth the criteria for determining the existence of a domestic industry in investigations based on patent infringement:

(a)(3) For the purposes of paragraph (a)(2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark, or mask work concerned –

- (A) significant investment in plant and equipment;
- (B) significant employment of labor or capital; or
- (C) substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337(a)(3) (1994) [emphasis added]. The domestic industry requirement is satisfied by meeting any one of the above three tests. See Certain Integrated Circuit Telecommunications Chips and Products Containing Same, Including Dialing Apparatus, Inv. No. 337-TA-315, USITC Pub. 2670, I.D. at 94 (August 1993) (portion adopted by Comm'n).

In 1988, by amending section 337 and including for the first time the factor “substantial investment in its exploitation, including . . . licensing,” Congress intended to expand the definition of domestic industry to include certain non-manufacturing activities. Certain Dynamic Sequential Gradient Compression Devices and Component Parts Thereof, Inv. No. 337-TA-335, Initial Determination on Temporary Relief at 59 (May 15, 1992) (Compression Devices). The Senate Finance Committee Report on the Senate’s version of the Omnibus Trade and Competitiveness Act of 1988 commenting on criteria (A) (B) and (C) of subsection (a) (3) of section 337, supra, stated:

The first two factors [(A) and (B)] in this definition have been relied on in prior Commission decisions finding that an industry exists in the United States. The third factor [(C)], however, goes beyond the ITC's recent decisions in this area. This definition does not require actual production of the article in the United States if it can be demonstrated that substantial investment and activities of the type enumerated are taking place in the United States.

Marketing and sales in the United States alone would not, however, be sufficient to meet this test. The definition could, however, encompass universities and other intellectual property owners who engage in extensive licensing of their rights to manufacturers. [emphasis added]

S.Rep. No. 71, 100th Cong., 1st Sess., at 129 (1987) (Senate Report); see also H.R. Rep. No. 40, 100th Cong., 1st Sess., at 157-58 (1987) (House Report).⁹ The administrative law judge finds that in view of the language of criterion (C) and its legislative history, supra, complainant has satisfied the domestic industry requirement if complainant has invested a substantial amount of money in a licensing program to exploit the '277 patent. He further finds that the statute does not require a complainant to manufacture the patented product nor does it require that a complainant show that a product covered by the '277 patent is made by complainant's licensees.

The administrative law judge finds that the evidence of record shows that complainant has invested a substantial amount of money in its overall licensing program. (FF 216 to 222, FF 242, FF 243). Complainant's patent portfolio currently includes six U.S. patents, all of which issued from applications related to the '277 patent. Complainant currently has four licensees involving the '277 patent, viz. The Weather channel, Sony, StarSight Technologies

⁹ Both the Senate Report and the House Report state that mere ownership of a patent is insufficient to meet the domestic industry requirement. Senate Report at 130; House Report at 154. "The owner of the property right must be actively engaged in steps leading to the exploitation of the intellectual property . . .". Id. The Senate Report and the House Report have substantially the same language.

and respondent TCE licenses, although TCE is licensed through StarSight. (FF 165).¹⁰ Those licenses have generated over{ }in payments to complainant. (FF 297). While complainant employs only five individuals, those individuals are all responsible for maintaining complainant's system of identifying, approaching, and negotiating with prospective licensees. Moreover complainant has incurred substantial expenditures relating to litigation of its patent rights, including the '277 patent, which is an extension of its licensing program. In particular, complainant incurred over{ }in legal fees in litigation with The Weather Channel, in which complainant alleged infringement of the '277 patent and two of its related patents, and which resulted in a license as to each of PMC's patents. (FF 195, 196, 197, 231, 240).

The Commission has held that a complainant may satisfy the domestic industry requirement of section 337 by showing that the domestic industry exploits the patent in issue, and that a complainant is not required to establish that it practices asserted claims. See e.g. Certain Microsphere Adhesives, Process for Making Same, and Products Containing Same, Including Self-Stick Repositionable Notes, Inv. No. 337-TA-366, Comm'n Op. at 24 (Jan. 16, 1996). In this investigation, respondents do not dispute that complainant has licensed at least certain claims of the '277 patent to Starsight. See e.g. BRBr at 130, MRRBr at 8. Thus, the manufacturing respondents' reply brief acknowledges that:

{ }

(MRRBr at 8, citing RX 1212 at page 3). Accordingly, the administrative law judge finds

¹⁰ TCE argued that Toshiba and Matsushita also have rights, under the StarSight license, through TCE (MRRBr at 2-3).

that undisputed evidence of record shows that complainant has licensed at least certain claims of the '277 patent.¹¹

Based on the foregoing, the administrative law judge finds that complainant's licensing activities satisfy the domestic industry requirement of section 337(a)(2).

IV Respondents' Licensing Defenses Are Rejected

The manufacturing respondents argued that, for the scope asserted by complainant in this investigation, claims 6 and 7 in issue fall within the scope of rights licensed by complainant to StarSight Telecast, Inc. (StarSight), through StarSight to TCE and from TCE on to Toshiba and Matsushita, the companies to whom TCE sells DSS receivers. (MRRBr at 2-3).

The broadcasting respondents adopted the arguments of the manufacturing respondents, and further argued that, because complainant transferred "all substantial rights" in the pertinent field of use to StarSight, complainant does not have standing to enforce those rights in the present investigation (BRBr at 130); and that, because the sale of DSS receivers by TCE is authorized, as is the purchaser's use, complainant's patent rights to claims 6 and 7 are exhausted with respect to the TCE receivers and the signals broadcast to them. (BRRBr at 41 to 45).¹²

¹¹ Respondents' licensing defenses are addressed infra.

¹² The broadcasting respondents also argued that the purchaser-users of Sony DSS receivers are licensed under the '277 patent (BRRBr. at 41). Complainant's counsel argued at closing arguments as follows:

MS. GONZALEZ: Your Honor, again, our position is that the Sony receivers are licensed to the extent that Sony has a license{ } In the context of remedy, we are not seeking an order that would be directed or interfere with the signals being sent to the Sony receiver, and we made that clear, and I believe

Complainant argued that none of the respondents are licensed under claims 6 and 7 in issue; that it has standing to enforce claims 6 and 7; that no implied license exists under the '277 patent; and that there has been no exhaustion of complainant's rights under claims 6 and 7. (CBr at 114 to 121).

The staff argued that claims 6 and 7 are not infringed because the DSS receivers do not meet all the claim limitations and hence a license to practice the claims is unnecessary. It further argued that if the DSS receivers are found to infringe claims 6 and 7, then respondents' license defenses should be rejected. (SBr at 97 to 101).

Respondents' arguments depend upon the assumption that {

(FF 312, 313, 314).

that's why there's confusion on this point. We're not seeking that not because we maintain somehow there's an implied license to the Respondents. We have just chosen not to proceed at this time in order to -- not to proceed on the rights that remain there, if you will, vis-a-vis the use rights as they relate to the Sony receiver.

So yes, there are licensed receivers to the extent that Sony has a license to manufacture a receiver, but is anyone out there licensed to receive signals from the Respondents that we have accused of infringement? The answer to that question is no. What we are seeking from the Commission in the form of a remedy, however, is limited -- is less than that which we believe we are entitled to because all we are seeking is that the Broadcast Respondents . . . disable that so that the receivers that are out there that are not Sony receivers can no longer receive their signals.

(Tr. at 3784-3785) (emphasis added). Accordingly, because complainant is not seeking any remedy relating to Sony receivers, the administrative law judge finds the question of whether the purchaser-users of Sony DSS receivers are licensed under the '277 patent to be moot.

Complainant has argued in this investigation that the DSS receivers are systems designed to detect a predetermined signal in a digital television transmission that includes numerous different signal types. Complainant, in arguing that users of TCE, HNS, Toshiba, Hitachi and Matsushita DSS receivers directly infringe claim 6 of the '277 patent, argued that the "DBS broadcast" is transmitted on 32 different transponders with each transponder transmitting information on a separate carrier frequency;{

} (CBr at 33). The administrative law judge finds nothing in the accused system which restricts said system to the field of use recitation of the original license from complainant to StarSight.

Complainant, in arguing that there is direct infringement of claim 7 of the '277 patent by the manufacturer respondents, argued that{

} (CBr at 45). Complainant's contentions are not restricted to the {
} between complainant and Starsight.

The administrative law judge finds that the agreement between StarSight and TCE¹³ also contains similar limitations that demonstrate that no license was granted to claims 6 and 7 for the allegedly infringing use. See the terms of the StarSight/TCE agreement. (see FF 337, 338, 339, 340, 341, 342, 343, 344).

In addition, it is found that claim 12 of the '277 patent, {
} involves
a reprogrammable system through which computer software can be sent to a local receiver
from a remote site. (FF 346). Such {
} is additional support that claim 7, {
} Moreover, the
administrative law judge finds that claims 6 and 7 are themselves similar, and are far more
similar to each other {
}

¹³ {
} StarSight's FRCP 30(b)(6) witness
agreed that StarSight cannot license rights in the "Harvey patents" broader than the field of use
limitation. (FF 320).

Based on the foregoing, the administrative law judge finds that TCE is not licensed under claims 6 and 7 and that TCE's customers (viz. Toshiba and Matsushita) and the providers of programming (viz. DIRECTV, and USSB) are not licensed as a result of the StarSight license agreement, since the agreement does not cover claims 6 and 7.

V Respondents Have Not Established That The '277 Patent Is Unenforceable

The manufacturing respondents argued that during the prosecution of the '277 patent, and all of the patents from which the '277 patent depends, applicants for said patents followed a course of conduct which included, among other things: (i) intentionally withholding material, non-cumulative references from the Patent Office Examiner during examination of the applications in hopes of obtaining a patent having a claim scope to which they were not entitled; (ii) intentionally misrepresenting the art before the Patent Office Examiner, as it related to the claims; (iii) overwhelming the Patent Office Examiner by burying highly relevant, in fact, anticipating references among hundreds of references having a lesser relevancy; and (iv) failing to point out an obvious error of the Patent Office Examiner in allowing all claims based upon a reason applying to just one of the 56 claims. (MRBr at 4). Hence, it is argued that the claims of the '277 patent are unenforceable due to inequitable conduct during prosecution of the '277 patent on the part of complainant's agents and co-inventors of the '277 patent. The manufacturing respondents also argued that the '277 patent is unenforceable because of applicants' "intentional failure" to disclose "highly material and invalidating" information. (MRBr at 17 to 25). Respondents specifically contend that inventor Cuddihy should have disclosed a "Proposed Capital Venture" to the Patent Office.

The broadcasting respondents argued that, based upon a review of the prosecution history of the '277 patent, it appears that there was no "meaningful" examination of the '501 application for the '277 patent; that the examination is fraught with errors that would not have been made had it been conducted in a "procedurally proper manner;" and that it appears that the cited references were not "meaningfully reviewed" in the examination by the Examiner. (BRCFF 832).¹⁴ It was further asserted that based on a review of the '277 patent file wrapper, it appeared that the '277 patent also is unenforceable due to failure to comply with 35 U.S.C. §151 by failure to file the entire issue fee. (BRBr at 115).¹⁵

Complainant argued that respondents have not shown inequitable conduct in connection with the '277 patent. (CRBr at 60-64). The staff argued that respondents have not presented clear and convincing evidence of intent on the part of the inventors or their attorney to conceal prior art from the Patent Office. (SRBr at 37).

Inequitable conduct resides in failure to disclose material information, or submission of false material information, with an intent to deceive. Materiality and intent must be proven by clear and convincing evidence. The term "gross negligence" has been used as a label for various patterns of conduct. It is definable, however, only in terms of a particular

¹⁴ The broadcasting respondents incorporated by reference that part of the manufacturing respondents' briefs dealing with complainant's alleged inequitable conduct before the Patent Office in obtaining patent claims related to and/or including the asserted claims of the '277 patent. (BRBr at 115).

¹⁵ The broadcasting respondents during the investigation moved to amend their response to the complaint to the effect that the '277 patent is unenforceable for alleged failure to comply with 35 U.S.C. §151 for failure to file the entire issue fee. Later they withdrew that motion upon the stipulation from complainant's counsel that complainant would not argue that the broadcasting respondents have waived their right to raise this issue in any other proceeding in any district court dealing with the '277 patent (Tr at 705-706). In view of that stipulation and the fact that this further assertion had not been briefed, said further assertion is not being considered.

act or of acts viewed in light of all the circumstances. A finding that particular conduct amounts to "gross negligence" does not of itself justify an inference of intent to deceive. Rather, the involved conduct, viewed in light of all the evidence, including evidence indicative of good faith, must indicate sufficient culpability to require a finding of intent to deceive. Kingsdown Medical v. Hollister Inc. 863 F. 2d 867, 9 U.S.P.Q.2d 1384, 1389, 1392 (Fed. Cir. 1988) (in banc as to certain portion cited), cert. denied, 490 U.S. 1067 (1989). The alleged conduct must not amount merely to the improper performance of, or omission of, an act one ought to have performed. Instead, clear and convincing evidence must prove that an applicant had the specific intent to accomplish an act that the applicant ought not to have performed, viz. misleading or deceiving the Patent Office. In a case involving nondisclosure of information, clear and convincing evidence must show that the applicant made a deliberate decision to withhold a known material reference. Molins PLC v. Textron Inc., 48 F.3d 1172, 33 U.S.P.Q.2d 1823, 1829 (Fed. Cir. 1995) (Molins).

The six applications on which the '277 patent is based¹⁶ underwent a lengthy prosecution. Thus, the first office action dated July 25, 1983 in the '510 application rejected the original claims on certain prior art. (FF 67). In spite of a lengthy response in opposition by the applicants (FF 68), in a second office action dated April 18, 1984 in the '510 application, the Examiner continued to reject the claimed subject matter on certain prior art.

¹⁶ The '501 application filed on May 3, 1993, from which the '277 patent issued on August 2, 1994 (FF 16), was the last of a series of six applications. Thus it was a continuation of the '226 application filed March 10, 1992, which '226 application was a continuation of the '126 application filed September 25, 1990, which '126 application was a continuation of the '096 application filed September 11, 1987 (FF 21, 22). The '096 application in turn was a continuation-in-part application of the '531 application filed February 14, 1986 which '531 application was a continuation of the '510 application filed on November 3, 1981. (FF 21, FF 22).

(FF 69). There followed a lengthy response in opposition. (FF 70). The third office action in the '510 application still rejected the claimed subject matter on certain prior art. (FF 71). Lengthy oppositions were subsequently filed. (FF 72, FF 73). Thereafter the Examiner on May 12, 1986 reopened the prosecution of the '510 application for new grounds of rejection. (FF 78). In the meantime the continuation '531 application was filed on February 14, 1986. (FF 83).

The first office action dated June 27, 1986, in the '531 application rejected claims over certain prior art. (FF 85). Applicants on January 2, 1987, traversed the rejection. (FF 87). Thereafter, while the '531 application was pending, the continuation-in-part '096 application was filed on September 11, 1987. (FF 89). On January 13, 1988 applicants also filed in the '096 application an Information Disclosure Statement (IDS) citing eight prior art references to the Examiner. (FF 90). The IDS was submitted with an attached PTO Form 3.72 in accordance with 37 C.F.R. §§ 1.56, 1.97.¹⁷ Specific reasons were presented as to why the listed references did not affect the patentability of the claimed subject matter. (FF 90).

The first office action dated November 9, 1988 in the '096 application, rejected claimed subject matter over certain prior art. (FF 91). Applicants, in a lengthy response dated May 19, 1989, traversed the rejection. (FF 92). In a second office action, the claimed subject matter was rejected for double patenting in view of claims 1-5 of the '725 patent. (FF 93). Applicants filed an amendment on January 29, 1990 amending certain

¹⁷ In 1988, 37 C.F.R. § 1.56 related to a duty to disclose information material to patentability while 37 C.F.R. § 1.97-98 concerned details about an IDS.

claims, canceling certain claims and adding certain claims and also traversing the double patent rejection. (FF 94). On June 19, 1990, applicants filed a Supplemental IDS citing seven prior art references. (FF 96). The Supplemental IDS attached Form PTO-1449 in accordance with 37 C.F.R. §§ 1.56, 1.99. It was represented that the listed references were not considered to be material to or to affect the patentability of the allowed claims and that the references came to the attention of applicants after submission of the January 29, 1990 amendment; that while it was realized that under M.P.E.P. § 609, the Examiner was not required to consider the cited references, applicants did not consider any action by the Examiner necessary; and that the "new references" were cited solely to complete the record before the Patent Office. Concise statements were made by applicants regarding the listed patents in accordance with 37 C.F.R. § 1.98(a)(2). Thereafter, while the '096 application was pending, applicants filed the continuation '126 application on September 25, 1990. (FF 97).

On February 15, 1991, applicants filed in the '126 application an IDS which cited nineteen prior art references. (FF 99). The IDS was filed in accordance with §§ 1.56, 1.97. Applicants represented that the listed references were considered of interest but did not affect the patentability of the claimed subject matter for specific reasons set forth in concise statements regarding the listed patents in accordance with 37 C.F.R. § 1.98(a)(2). The first office action in the '126 application, rejected the claimed subject matter for double patenting in view of the '825 patent. (FF 100). Applicants' response dated March 22, 1991 traversed the rejection. (FF 101). While the '126 application was pending applicants on March 10, 1992 filed the '226 application. (FF 104).

The first office action in the '226 application restricted the claimed subject matter into two groups. (FF 105). Applicants in a response dated October 9, 1992, traversed the restriction requirement in part and also amended and added certain claims. (FF 106). Applicants also on October 9, 1992, submitted a supplemental IDS in accordance with the duty of disclosure under 37 C.F.R. § 1.56(a) and in conformance with the procedures of 37 C.F.R. §§ 1.97-98 and M.P.E.P. § 609. The supplemental IDS listed one reference and asked that it be considered and made of record. (FF 107).

While the '226 application was pending, applicants filed the '501 application on May 3, 1993. (FF 113). A first IDS in the '501 application, which listed thirty prior art references was filed on June 24, 1993. (FF 114). The IDS was filed in accordance with the duty of disclosure under 37 C.F.R. § 1.56(a) and in conformance with the procedures of 37 C.F.R. §§ 1.97-98 and M.P.E.P. § 609.¹⁸ (FF 114).

Claims 6, 7, and 44 in issue were added to the '501 application on July 14, 1993. (FF 115). In the '501 application, applicants filed a second IDS on November 5, 1993 in accordance with 37 C.F.R. § 1.56(a) and the procedures of 37 C.F.R. §§ 1.97-98 and M.P.E.P. § 609. The second IDS listed some 176 references. (FF 118). A third IDS, which listed eight references, was filed on November 22, 1993. It also corrected some errors in the second IDS and further provided a reference category list. (FF 119). This

¹⁸ M.P.E.P. § 609, as revised on November 14, 1992, stated that applicants and other individuals substantially involved with the preparation and/or prosecution of a patent application have a duty to submit to the Patent Office information which is material to patentability as defined in 37 C.F.R. 1.56; and that the filing of an IDS shall not be construed as either a representation that a search has been made, and there is no requirement that an applicant for a patent make a patentability search, or as an admission that the information cited in the IDS is, or is considered to be, material to patentability as defined in 37 C.F.R. 1.56(b), 37 C.F.R. 1.97(h).

reference category list listed categories of the submitted references and identified their relevance to each pending claim and further identified the references that, in applicants' views, were most relevant to each pending claim. Applicants represented in the third IDS that the reference category list was submitted "merely to assist the Examiner" and that although applicants have "attempted to identify those references that are believed to be the most relevant to each claim, there may exist other relevant references not identified as such." Said list grouped patents into Groups A - S and included an additional group entitled "Other Patents Unclassified by Group." Additionally included as part of the Reference Category List was a list entitled "Most Relevant Reference Categories . . . On a Claim by Claim Basis." The Most Relevant Reference Categories list listed each claim individually and applied to each claim a number of groups from the Reference Category list allegedly including the most relevant references to that claim. (FF 119). The submission of references in the '277 patent application was done as a collaborative effort by attorney Scott in part, by Harvey in part, and by those under the supervision of Scott in part. (FF 119) A fourth IDS pursuant to 37 C.F.R. §§ 1.97-98 and M.P.E.P. § 609 was filed on February 1, 1994. The fourth IDS listed 49 references and stated that although all cited references may be relevant, applicants would like to bring to the Examiner's attention U.S. Patent No. 4,396,595. (FF 120). The Examiner initialed every form 1449 sheet filed with the four IDSs during the prosecution of the '501 application. (FF 122). On March 31, 1994, the Examiner issued a notice of allowance in the '501 application which stated that claims 1-56 which included claims 6, 7 and 44 in issue were allowable "over the prior art of record." The '277 patent issued on August 2, 1994. (FF 16).

As seen from the prosecution, supra, there were a total of five Patent Office rejections on prior art in the six applications, excluding rejections for doubling patenting, that led to the issuance of the '277 patent. In addition, applicants in the six applications filed a total of eight Information Disclosure Statements. While the claims in issue were not presented to the Patent Office until July 14, 1993, when applicants filed an amendment in the '501 application (FF 115), the Patent Office had access to a portion of the specification of the '277 patent since Nov. 3, 1981 when applicants filed the '501 application (FF 21, FF 22) and had access to the complete specification of the '277 patent at least since September 11, 1987, when applicants filed the '096 application. (FF 89).

As further seen from the prosecution, supra, in the '501 application, applicants filed a total of four IDSs and while the four IDSs listed a total of some 253 references, there was no objection by the Examiner that the IDSs were not in conformance with the 37 C.F.R. § 1.97-98. To the contrary, applicants presented a detailed reference category list while claims 6, 7 and 44 in issue were pending. (FF 115, 119). Moreover, while the Examiner in the '501 application on September 27, 1993 only rejected original claims 1-3 not in issue and said nothing about the claims in issue that were pending before him (FF 113, 115, 116), on March 31, 1994 (after all of the some 253 references through the four IDSs had been submitted to the Patent Office, viz. on June 24, 1993 (the first IDS) (FF 114), on November 5, 1993 (the second IDS) (FF 118), on November 22, 1993 (the third IDS (FF 119) and on February 1, 1994 (a fourth IDS) (FF 120)), the Examiner specifically referenced the July 14, 1993 amendment in the '501 application which added the claims in issue and concluded that all of the pending claims, which included the claims in issue, "are allowable

over the prior art of record.” (FF 123). Each of the four IDSs had requested that the references submitted with the IDSs be made of record. (FF 114, FF 118, FF 119, FF 120). Hence, the administrative law judge finds that the Examiner found the claims in issue allowable over the some 253 references.

The respondents argued that there was no “meaningful” review of the cited references by the Examiner. However, the prosecution of the ‘277 patent shows that the Examiner allowed the claims in issue over the prior art that was submitted with the four IDSs in the ‘501 application. The administrative law judge further finds that the Examiner did consider the references cited in the four IDSs because it is assumed that public officials do their assigned jobs. See Molins, 48 F.3d at 1180, 33 U.S.P.Q.2d at 1832. U.S. patents issue with a presumption of validity. See 35 U.S.C. 281. That presumption does not vary depending on whether a party contends that there is or is not a “meaningful” examination by the Patent Office.

Although lapse on the part of an Examiner does not exculpate an applicant whose acts are intentionally deceptive, any doubt as to whether the Examiner lapsed in his duty does not increase the burden on the applicant nor does the applicant's obligation of candor replace the Examiner's duty to examine the claims. Northern Telecom Inc. v. Datapoint Corp. 908 F.2d 931, 15 U.S.P.Q.2d 1321, 1327 (Fed. Cir. 1990). Moreover, the mere fact that an applicant attempts to distinguish the claimed invention from only certain prior art does not constitute a material omission or misrepresentation because an Examiner is free to reach his or her own conclusion regarding the claimed invention based on the art in front of him.

guides. Unlike expert testimony, these sources are accessible to the public in advance of litigation. They are to be preferred over opinion testimony, whether by an attorney or artisan in the field of technology to which the patent is directed. Vitronics, 90 F.3d at 1580, 39 U.S.P.Q.2d at 1579.

A. Claim 6

Claim 6 of the '277 patent reads:

A system for identifying a predetermined signal in a television program transmission in which a plurality of signal types are transmitted said signal being transmitted in a varying location or a varying timing pattern, said television program transmission being separately defined from standard analog video and audio television, said system comprising:

a digital detector for receiving said transmission and detecting said predetermined signal in said transmission based on either a specific location or a specific time; and

a controller operatively connected to said detector for causing said detector to detect said predetermined signal based on either a specific location or time, said controller being programmed with either the varying locations or the varying timing pattern of said signal. [emphasis added] [FF 17]

In issue for claim interpretation are the phrases (1) "predetermined signal," (2) "in a television program transmission," (3) "plurality of signal types," (4) "separately defined from standard analog video and audio television," (5) "digital detector," (6) "based on either a specific location or a specific time," and (7) "controller operatively connected to said detector for causing said detector to detect said predetermined signal based on either a specific location or time, said controller being programmed with either the varying locations or the varying timing pattern of said signal."

1. "Predetermined Signal"

Complainant argued that predetermined signal "recites to the technique of preprogramming, or preinforming, the receiver with information about the signal, such as location or timing information." (CRBr at 2). Complainant further argued that:

the predetermined signal is the signal that goes to the microprocessor and causes it to do the multitude of things that are described in the patent. The predetermined signal is not the portion of the television transmission broadcast that goes through a regular television set and shows up as something that the viewer watches.

(Taylor, Tr at 3700). Complainant also argued that a "predetermined signal" is a signal "about which the receiver has been pre-informed and which is intended for the receiver, such as the control signals, (for example, SPAM signals) of the '277 patent" (CRBr at 3-4) or that "predetermined signals" are those "signals intended for the receiver station itself, rather than intended for the viewer or user of the system. Such signals would include control instructions and control information." (CRF 256). In addition, complainant argued that "[i]n short, the predetermined signal is a control signal" (emphasis added). (CBr at 22).

Complainant's counsel also argued at closing arguments:

JUDGE LUCKERN: Would you want me to interpret that claim that it could be a control signal, could be a noncontrol signal, Mr. Taylor?

MR. TAYLOR: No, sir, it has to be a signal that is used for controlling the digitally addressed hardware at the receiver site. It's a claim limitation, your Honor, and it's like any other limitation in a patent claim. It is intended to create a circle of coverage outside of which something would not fall, and the contention we have made, and I believe we've made it consistently, although it's fairly difficult in some contexts to articulate. The contention we have made is that predetermined signals are digital signals that are sent addressed to the

microprocessor portion of the television set that is contemplated by the invention.

(Taylor, Tr at 3703) (emphasis added).

The staff argued that a "predetermined signal" is "most properly construed to mean the signals generally identified in the specification as [signal processing apparatus and methods or] SPAM signals. . . ." The staff further argued that "the notion of being intended for the receiver, I'm not comfortable with that because I'm not quite sure what is meant, that all the signals come to the receiver. . . . meter monitor information, for example, is a clear demonstration from the patent that not all SPAM signals are intended to control receiver equipment. So I disagree with that." (Tr at 3692).

Respondents argued that "predetermined signal" as used in claim 6, is "any signal that is specified for identification in advance." (BRBr at 10).²¹ In addition, respondents argued that the phrase "predetermined signal" in claim 6 is not limited to control signals, but would include both control signals and non control signals. Thus, respondents' counsel argued:

It [predetermined signal] would include, for example, the SPAM signals, some of which are control signals. I would say . . . it would include, for example, other signals that, for some reason, might not be a SPAM signal and might be embedded in a television transmission.

And I would say with regard to the SPAM signal issue, when one tries to define something in terms of SPAM signal, one just moves to the question of what is a SPAM signal, which is a difficult issue. . . .

JUDGE LUCKERN: Is it Respondents' position that it does not have to include a control signal?

²¹ The manufacturing respondents adopted the post trial arguments of the broadcasting respondents on the issues of the interpretation of the claims in issue. (MRBr at 1).

MR. TOUTON: That's right. It might or it might not be. There's no limitation with respect to a control signal inherent in the phrase "predetermined signal."

(Touton, Tr at 3701-3702).

For claim interpretation, the administrative law judge must first look to the ordinary meaning of claim language. See Vitronics, 90 F.3d 1576, 1578, supra. Based on the specific language of claim 6, a "predetermined signal" must be a signal that is "in a television program transmission;" which signal is "transmitted in a varying location or a varying timing pattern;" and which signal is capable of being detected by the claimed "digit detector" "based on either a specific location or a specific time." Thus, the administrative law judge finds, based on the language of claim 6, that a "predetermined signal" must be something less than an entire "television program transmission" because said "predetermined signal" must be "in" a "television program transmission." In addition, the "predetermined signal" must be a signal that the "digital detector" is capable of detecting, and therefore must be a digital signal.²²

The ordinary meaning of claim words can often be understood from technical treatises and dictionaries. See Vitronics, 90 F.3d 1576, 1578, supra. The two claim words in issue are "signal" modified by the word "predetermined." The word signal is defined in the electronics field as "any transmitted electrical impulse," Academic Press Dictionary of Science and Technology, 1986 (1992), and in the telecommunications field as "1. data that are transferred over a given communications system by visual or aural means. 2. any coded

²² It is undisputed that the "predetermined signal" of claim 6 must be a digital signal (CBR : 20, BRBR at 19-20, SBR at 16, fn. 14).

message or text that is conveyed via electrical, acoustical, or electronic means.” Id. The dictionary definition of “signal” in the field of communications is “1. A visual, aural, or other indication used to convey information. 2. The intelligence, message, or effect to be conveyed over a communication system.” See McGraw Hill Dictionary of Scientific and Technical Terms 1730 (4th ed 1989). See also Webster’s Third New International Dictionary, 2115 (1981) (“[9] b: the intelligence, message, sound, or image conveyed in telegraphy, telephony, radio, radar, or television c: a detectable physical quantity or impulse (as a voltage, current, magnetic field strength) by which messages or information can be transmitted.”). The ordinary meaning of “predetermine” is simply “1. To determine, decide, or establish in advance: *factors that predetermine an outcome.*” The American Heritage Dictionary, 975 (2d ed. 1982)(emphasis in original). Predetermine is also defined as “[1] b: to determine beforehand: settle in advance . . . 2: to impose a direction or tendency on beforehand.” Webster’s Third New International Dictionary, 1786 (1981).

Based on the foregoing, the administrative law judge finds that the meaning of a “predetermined signal,” based on the specific language of claim 6, would be a digital “detectable physical quantity or impulse (as a voltage, current, magnetic field strength) by which messages or information can be transmitted” in a television program transmission, or digital “data that are transferred over a given communications system by visual or aural means” wherein said “detectable physical quantity or impulse” or “data” are determined, decided, or established in advance.

The administrative law judge must also consider any definition given to the claim term “predetermined signal” by the inventors in the ‘277 patent specification. See Vitronics,

90 F.3d at 1577. There is no antecedent usage of the phrase "predetermined signal" in the '277 patent specification.²³ Thus, "predetermined signal" is not expressly defined in the '277 specification (see e.g. CRFF 64, BRFF 291, SRFF at 8).

The specification contains numerous uses of the word "predetermined." For example, the specification uses the phrases "predetermined data bits," "predetermined fashion," "predetermined locations," "predetermined program-unit distances,"

²³ Claim 5 does use the phrase "predetermined signal." Specifically, claim 5 reads:

5. A television receiver system comprising:

a line receiver for receiving a video signal of an analog television transmission and selecting portions of one or more lines of said video signal containing embedded signals;

a first digital detector operatively connected to said line receiver for receiving the selected portions of video lines containing the video embedded signals and detecting the presence of a first predetermined signal in said selected lines of video;

a filter for receiving an audio signal of said analog television transmission and selecting portions of the audio signal containing embedded signals;

a second digital detector operatively connected to said filter for receiving the selected portion of the audio signal containing the audio embedded signals and detecting the presence of a second predetermined signal in said selected portions of said audio signal;

a storage device operatively connected to said first and said second digital detectors for receiving and storing information contained in at least one of said first and second predetermined signals, and passing said information to a processor; and a controller operatively connected to said detectors, said line receiver and said filter for controlling the selected portions of said video and audio signals passed from said line receiver and filter, respectively, to said detectors based on either a location or a timing pattern of the selected portions; said controller programmed with:

(1) information as to changing locations or changing timing patterns of said predetermined signals; and

(2) information as to composition of said predetermined signals.

(CX-2, '277 patent at col. 311, ln. 61 - col. 312, ln. 28)(emphasis added). However, claim 5 does not explicitly define the phrase "predetermined signal."

"predetermined overlay-number distances," "predetermined first-bit location,"
"predetermined bit locations," "predetermined television channel selection pattern,"
"predetermined period of time," "predetermined radio frequency selection pattern,"
"predetermined interval," "predetermined remote station," "predetermined
appearance-of-tampering information," "predetermined level of fullness," "predetermined
error correction procedures," and "predetermined capacity." (CX-2, '277 patent). The
administrative law judge finds that each of the above uses of the word "predetermined" in
the '277 specification is consistent with the dictionary definitions of that word, supra.
Accordingly, he finds that the word "predetermined" used in claim 6 requires a signal that is
determined, decided, or established in advance.

While the specification does not contain an express definition of "predetermined
signal," the specification contains numerous uses of the word "signal." Under the
"Summary of the Invention," the '277 specification reads:

The present invention employs signals embedded in programing. . . .
In the present invention, the embedded signals contain digital information that
may include addresses of specific receiver apparatus controlled by the signals
and instructions that identify particular functions the signals cause addressed
apparatus to perform.

* * *

. . . . In all cases, signals may convey information in discrete words,
transmitted at separate times or in separate locations, that receiver apparatus
must assemble in order to receive one complete instruction.

(The term "signal unit" hereinafter means one complete signal instruction or
information message unit. Examples of signal units are a unique code
identifying a programming unit, or a unique purchase order number identifying
the proper use of a programming unit, or a general instruction identifying
whether a programming unit is to be retransmitted immediately or recorded for
delayed transmission. The term "signal word" hereinafter means one full

discrete appearance of a signal as embedded at one time in one location on a transmission. Examples of signal words are a string of one or more digital data bits encoded together on a single line of video or sequentially in audio. Such strings may or may not have predetermined data bits to identify the beginning and ends of words. Signal words may contain parts of signal units, whole signal units, or groups of partial or whole signal units or combinations.)

(CX 2, col. 9, ln 48 - col. 10, ln. 33) (emphasis added). In addition, the '277 specification under the heading "Introduction to the Signals of the Integrated System," reads as follows:

The signals of the present invention are the modalities whereby stations that originate programming transmission control the handling, generating, and displaying of programming at subscriber stations.

(The term, "SPAM," is used, hereinafter, to refer to signal processing apparatus and methods of the present invention.)

(CX 2, col. 24, lns. 35-41)(emphasis added). Thus, the specification teaches that the "signals of the present invention" are "the modalities whereby stations that originate programming transmission control the handling, generating, and displaying of programming at subscriber stations." Thereafter, the specification provides additional description of the content of signals contemplated by the '277 patent, under the heading "Introduction to the Signals of the Integrated System," as follows::

The information of SPAM signals includes data, computer program instructions, and commands. Data and program instructions are often recorded in computer memories at subscriber stations for deferred execution. Commands are generally for immediate execution and often execute computer programs or control steps in programs already in process. Often said data, programs, and commands control subscriber station apparatus that automatically handle, decrypt, transmit, and/or present program units of conventional television, radio, and other media.

(CX 2 at col. 25 lns. 7 - 17).²⁴ Hence, the '277 specification contains a description of "the signals of the present invention."

The description of "signals" in the '277 specification is found by the administrative law judge to be consistent with the dictionary definition, supra, of signal as a "detectable physical quantity or impulse (as a voltage, current, magnetic field strength) by which messages or information can be transmitted" in a television program transmission, and as "data that are transferred over a given communications system by visual or aural means," and as further limited by other language in claim 6 to be "digital" signals that are something less than an entire "television program transmission." Thus, the specification teaches that "signals" "contain digital information" (CX 2, '277 specification at col. 9, ln. 56-57)(emphasis added), see also CX 2 at col. 10, ln. 13-15 (signals "convey information"), which "information" may include "addresses of specific receiver apparatus controlled by the signals and instructions that identify particular functions the signals cause addressed apparatus to perform,"(CX 2, '277 specification at col. 9, ln. 56-60), and also "includes data, computer program instructions and commands." (CX 2, '277 specification at col. 25, ln. 7-17) (emphasis added), see also col. 10, ln. 13-15 of the '277 patent.

Accordingly, based on the use of "predetermined" and the use of "signal" in the specification, the language of claim 6, and the ordinary, dictionary definition of said words,

²⁴ The specification also describes signals that are not SPAM signals:

... said program originating studio embeds in the video portion and transmits particular SPAM check information that is not a SPAM message and consists only of a particular check sequence of binary information followed by an end of file signal.

(CX 2 at col. 168, lns. 39-45) (emphasis added).

administrative law judge finds that the phrase "predetermined signal" as used in claim 6, requires a digital "detectable physical quantity or impulse (as a voltage, current, magnetic field strength) by which messages or information can be transmitted" in a television program transmission, or "data that are transferred over a given communications system by visual or aural means," which is something less than an entire "television program transmission," and which is "determined, decided, or established in advance.

Referring to the prosecution history, the phrase "predetermined signal" first appeared when claim 6 was presented to the PTO in a preliminary amendment filed on July 14, 1993 (FF 115-117). The administrative law judge finds that the prosecution history does not contain any discussion of said term.

The administrative law judge also finds extrinsic evidence unnecessary to understand the meaning of the phrase "predetermined signal" as he finds no remaining ambiguity in that phrase after his review of intrinsic evidence. However, the administrative law judge may also look to expert testimony to gain an understanding of the technology in issue.²⁵ Based on his review of the expert testimony, he finds that said testimony confirms the above definition of predetermined signal. Specifically, complainant's expert Davis (FF 559) testified that one of ordinary skill in the art in 1981 would not understand the term "signal" or the phrase "predetermined signal" to be limited to a "control signal." Thus, he testified:

Q Is there anything about the word "signal" in the electrical engineering arts that limits it to a control signal?

A In and of itself in isolation?

²⁵ See Vitronics, 90 F.3d at 983, 34 U.S.P.Q.2d at 1332-33.

Q Right.

A No.

* * *

Q . . . taking [the phrase "predetermined signal"] outside the context of this patent, is there anything about the phrase "predetermined signal" that you believe would have meant to an electrical engineer in 1981, or would mean to an electrical engineer today that it must be a control signal?

A If you remove it completely from the context of the claims, the analysis inasmuch as the claims, I don't think, has any meaning, but no, I don't think it would be limiting.

(Davis, Tr at 3321). Respondents' expert Ciciora (FF 588) testified regarding the ordinary meaning of signal as follows:

Q Let me focus for a moment on the word "signal." Is that a term that has special meaning to you as an electrical engineer?

A "Signal" is a very commonly used term, and we generally mean it to be taking an electrical quantity like voltage or current and modifying it in some manner to convey information.

(Ciciora, Tr at 2456). In addition, respondents' expert Schreiber (FF 571), testified that "predetermined signals" as used in claim 6 refers to "the digital data that is embedded in the analog television program for some control or instruction purposes at the receiver."

Specifically, he testified:

Q All right. So, with that prefatory statement, how did you understand the term "a predetermined signal"?

A The word "predetermined" is used in the patent so many times I couldn't count it, but I don't think "predetermined signal" is used, or at least if it is used, it is not well defined. However, I have a working opinion that what it refers to is the digital data that is embedded in the analog television program for some control or instruction purposes at the receiver.

Q Does the patent specification speak of imbedding spatial data in an analog transmission system?

A Oh, yes. In fact, the word "embedment" is used quite a bit and examples are given of where you might embed the signal, mainly in the vertical blanking interval. But at some -- some mention is made of using the audio signal or inputting the signal in some place where we would be either, where it would be either invisible or inaudible. And then in figure 2A there is mention of imbedding a signal somewhere else. But that somewhere else is not defined except to be different from the ones I had already mentioned. But nevertheless I thought "predetermined signal" referred to that embedded signal.

(Schreiber, Tr at 1396) [emphasis added]. Said definitions are consistent with the definition found supra from the ordinary meaning of the claim terms and the description of the invention in the '277 patent specification.

Complainant has argued, based on the specification of the '277 patent, that "the predetermined signal of claim 6 - a digital signal embedded in a television program transmission which varies in timing or location - must be construed as containing data and control instructions intended for the receiver. In short, the predetermined signal is a control signal." (CBr at 22). Each of the broadcasting respondents and the staff rely on the fact that the '277 specification describes an "information segment" of the "SPAM" signals, and argued that said "information segment" of the SPAM signals are not directed to the receiver apparatus, as argued by complainant, but instead are passed on to the viewer. (SBr at 19-23 BRBr at 12-15).

The administrative law judge finds that the language of claim 6, supra, the language of other, non-asserted claims in the '277 patent, which the administrative law judge must look to in defining the scope of the patented invention, Bell Communications Research, Inc. v. Vitalink Communications Corp., 55 F.3d 615, 620, 34 U.S.P.Q.2d 1816, 1819 (Fed. Cir.

1995), and examples and descriptions contained in the '277 specification do not support complainant's proffered interpretation that a "predetermined signal" must be a control signal.

Each of claims 1, 2 and 3 of the '277 patent, which claims are not in issue, use the phrase "control signal." Complainant argued at closing arguments:

Now, the Respondent argues primarily that this is an incorrect interpretation, because claims 1, 2 and 3 use the phrase "control signal." I remind you that the doctrine of claim differentiation has several significant limitations which render claims 1, 2 and 3 irrelevant in the context of this case to what you're about.

First of all, the doctrine of claim differentiation has never been a binding rule of law. It is a rule, at best, of guidance for the interpreter of the claim. More importantly, that doctrine starts with the premise that every claim in a patent has to have a different scope so that doctrine is applicable only where you have two claims that are being urged to have essentially identical scope, but with different language. Well, if you look at claim 3 or claim 1 or claim 2, they're very different in other particulars, not just the signal being described but other particulars, so the scope of those claims is completely irrelevant to the scope of claim 6. And for that reason, your Honor, the term "predetermined signal," there's nothing I know of in patent law that precludes it from having the same scope, the same limitations as the term "control signal" in claims 1, 2 and 3.

Furthermore, I suggest when you read claims 1, 2 and 3, you will see that the word -- it's not even clear that the word "control signal" in those claims is applying to the same signals that are being discussed in claim 6. The control signals in claim 3 may well be applied to internal control signals. We haven't had any testimony on that. We haven't spent a huge amount of time trying to analyze those, but I suggest to your Honor that the doctrine of claim differentiation is the classic red herring and has no bearing on the way in which you interpret claim 6.

(Taylor, Tr at 3574 - 3575).

Under the doctrine of "claim differentiation," the express use of a phrase or term in one claim generally negates an attempt to import that limitation into another claim by implication. See e.g. Marsh-McBirney, Inc. v. Montedoro-Whitney Corp., 882 F.2d 498,

504, 11 U.S.P.Q.2d 1794, 1798 (Fed. Cir. 1989) (Marsh-McBirney) ("Reading the [dependent] claim . . . requirement that probes be electromagnetic into [the independent] claim . . . violates the principle that 'narrow claim limitations cannot be read into broad [claims] whether to avoid invalidity or to escape infringement.'"), Environmental Designs Ltd. v. Union Oil Co. of California, 713 F.2d 693, 218 U.S.P.Q. 865, 871 (Fed. Cir. 1985). c.f. Hormone Research Foundation, Inc. v. Genetech, Inc., 904 F.2d 1558, 15 U.S.P.Q.2d 1039 (Fed. Cir. 1990) ("The doctrine of claim differentiation . . . , although well-established in our cases, cannot overshadow the express and contrary intentions of the patent draftsman. It is not unusual that separate claims may define the invention using different terminology, especially where . . . independent claims are involved."). See also Autogiro Co. of America v. United States, 384 F.2d 391, 404, 155 U.S.P.Q. 697 (Ct. Cl. 1967) ("[c]laim differentiation is a guide, not a rigid rule. If a claim will bear only one interpretation, similarity will have to be tolerated."), Moleculon Research Corp. v. CBS, Inc., 793 F.2d 1261, 229 U.S.P.Q. 805 (Fed. Cir. 1986). See also Tandon Corp. v. U.S. Int'l Trade Comm'n, 831 F.2d 1017, 1023-24, 1028, 4 U.S.P.Q.2d 1283, 1288, 1292 (Fed. Cir. 1987) (Tandon) ("There is presumed to be a difference in meaning and scope when different words or phrases are used in separate claims. To the extent that the absence of such difference in meaning and scope would make a claim superfluous, the doctrine of claim differentiation states the presumption that the difference between claims is significant. . . . the same time, practice has long recognized that 'claims may be multiplied . . . to define the metes and bounds of the invention in a variety of different ways.' . . . Thus two claims which read differently can cover the same subject matter. . . . Whether or not claims differ

from each other, one can not interpret a claim to be broader than what is contained in the specification and claims as filed.”).

Claims 1, 2, and 3 are independent claims. Moreover, respondents do not argue that interpreting a “predetermined signal” in claim 6 as a “control signal” would make claims 1, 2, and 3 “superfluous.” See Tandon, *supra*. Accordingly, the administrative law judge finds that the use of the phrase “control signal,” in claims 1, 2, and 3, provides some evidence that a “predetermined signal” is not limited to a “control signal” but is not dispositive of the issue.

The finding that a “predetermined signal” is not limited to a “control signal” is supported by the specification of the '277 patent. The administrative law judge finds that the specification describes in detail the composition and use of “SPAM” signals, as well as non SPAM signals. Thus, the specification teaches regarding SPAM signals that, in one example of SPAM signals of the '277 patent, they are divided into several “segments,” one of which is an “information segment.” (CX 2, col. 26, lines 43-45, and Figure 2E). The specification defines the “information segment” of a SPAM signal as follows:

Information segments follow commands and can be of any length. Program instruction sets, intermediate generation sets, other computer program information, and data (all of which are organized in a fashion or fashions well known in the art) are transmitted in information segments. An information segment can transmit any information that a processor can process. It can transmit compiled machine language code or assembly language code or higher level language programs, all of which are well known in the art. Commands can execute such program information and cause compiling prior to execution.

(CX 2, col. 31, lines 28-39) (emphasis added). The administrative law judge finds this disclosure in the specification that “an information segment can transmit any information that a processor can process” is evidence that a “predetermined signal” in claim 6 can also

transmit "any information that a processor can process," and is not limited to transmitting "control information."

This finding is further supported by the teaching in the '277 specification that describes one function performed by SPAM signals as "[p]rint the contents of the information segment." (CX 2, col. 27, line 47). That function is exemplified in at least two examples in the '277 specification, where data transmitted in a SPAM signal is printed on a attached printer as text which can be read by a viewer (FF 502, 508 - 511). Hence, as argued by respondents and the staff, and contrary to the argument of complainant, the administrative law judge finds that the specification teaches SPAM signals that contain information that is not only intended for the receiver apparatus, but instead is passed on to a viewer or user of the system.

Based on the foregoing, the administrative law judge rejects complainant's argument that a "predetermined signal" must be "signals intended for the receiver station itself, rather than intended for the viewer or user of the system."

2. "In A Television Program Transmission"

Respondents argued that the claim phrase "in a television program transmission" requires that "the predetermined signal must be *embedded* in the television program signal" (emphasis in original) and that "[c]onsistent with the meaning of 'embed' (to enclose or surround closely or introduce as an integral part),[] the predetermined signal must be received as an integral part of the television transmission, rather than merely being coexistent with, but separate from, the program signal." (BRBr at 16-17). Respondents' counsel also argued:



[Judge Luckern] Mr. Touton, you're the one -- DIRECTV has made this big point about embedded in the television signal, again, making reference to page 16 of your May initial brief. Again, to save time, you end up -- I believe you take a position if it's not embedded in it, it's not in a television program transmission. That's what I believe your position is; is that correct?

MR. TOUTON: Yes, that's our position, and I again mean to use "embedded" to contrast with the phrase like "along with," "separate from, but alongside." That's what I'm trying to exclude within the meaning of "in." I'm really just interpreting the word "in" and what I believe to be its ordinary sense, as "within."

(Touton, Tr at 3713). The staff argued regarding the phrase "in a television program transmission:"

I think for my purposes, I'm willing to accept a more generalized interpretation of television as being in a television transmission such that if you look at the digital detector section of claim 6, a digital detector for receiving said transmission and detecting said predetermined signal in said transmission to me, that implies if one receives television transmission, the detector has also obtained possession in some fashion of the predetermined signal.

So I'm not sure that the claim requires that to be done in a particular manner, merely the reception of the television transmission will accomplish the reception of the predetermined signal.

(Tr at 3712-3713). Complainant argued that "[i]f the word 'embedded' implies some special manipulation of the signal, it is not relevant here because claim 6 does not use the word and, therefore, does not require it," further noting that the '277 specification contains an example in which SPAM signals are transmitted along with digital video and digital audio transmissions. (CRBr at 4-5). Complainant did not object to BFF310, which read "PMC and Respondents agree that the predetermined signal must be embedded in the television program signal. (N. Davis, Tr 3365:6-9)." See CRFF at 44-45. In addition, complainant argued that the "predetermined signal" of claim 6 is "a digital signal embedded in a

television program transmission which varies in timing or location. . . .” (CBr at 22).

Complainant’s counsel also argued regarding “in a television program transmission:

MR. RUYAK: Your Honor, I believe that our interpretation of this phrase is closely aligned with the Staff’s position, and that is that “embedded” . . . is defined as being within the television transmission in some place.

The specification gives a lot of examples, however. It starts on column 48, line 35 and continues to the next page where it does discuss a normal transmission location, which says it could be in the vertical blanking interval. It also says there that it could be some place in the audio signal. It gives examples, but simply, “embedded” means along with.

In fact, if you look at column 162, line 16, there’s an example in Wall Street Week in which it specifically set forth that the transmission could be digital and audio – digital video and digital audio, which means it would be a bit stream of data, the point being that the inventors here described this clearly as being within, as Mr. Brittingham has said, it’s within the transmission.

(Ruyak, Tr at 3714-3715). (emphasis added)

Referring to the claim language claim 6 requires “a predetermined signal in a television program transmission.” Claim 6 does not use the word “embed” or “embedded.”

The dictionary definitions of “in” include “1 a (1) - used as a function word to indicate location or position in space or in some materially bounded object <put the key ~ the lock> . . . b (a) - used as a function word to indicate position or location in something immaterial or intangible <saw him ~ my dreams>.” Id. at 1139. Similarly, the word “embed” is defined as “1 a: to enclose closely in or as if in a matrix <pebbles *embedded* in silt> <~ brick firmly in mortar> . . . 2: to surround closely : ENCLOSE . . . <the great bulk of the tree slowly *embedded* into the soft soil>.” Webster’s Third New International Dictionary, at 739 (1986). Thus, to the extent that the meaning of the word

"in" is synonymous with the word "embed," the administrative law judge finds that the ordinary meaning of "in a television program transmission" would include a predetermined signal that was "embedded" in a television program transmission.

The dictionary definition of "Television" is "1: the transmission and reproduction of transient images of fixed or moving objects; *specif* : an electronic system of transmitting such images together with sound over a wire or through space by apparatus that converts light and sound into electrical waves and reconverts them into visible light rays and audible sound." Webster's Third New International Dictionary, at 2351 (1981). Combining the above definitions, the administrative law judge finds that the ordinary meaning of "a predetermined signal in a television program transmission" requires a "predetermined signal" that is located or positioned within an electronic transmission that transmits "transient images of fixed or moving objects . . . together with sound over a wire or through space."

Turning to the specification, as discussed under "predetermined signal" *supra*, the '277 patent teaches that "[t]he present invention employs signals embedded in programing." Moreover, while the specification teaches that signals are not required to be embedded "in television programming," the specification teaches as alternatives signals "embedded" in other transmissions. Thus, the specification reads:

(To minimize the risk that program instruction sets may become separated from their associated television programming, said sets are normally embedded in their associated television transmissions. But it is not an absolute requirement of the preferred embodiment that all program instruction sets be so embedded. If the volume of program instruction set information that a given programming transmission must transmit exceeds the transmission capacity of said transmission [e.g., if the audience includes viewers who do not have overlay capacity and would see "snow" were set information transmitted in portions of the transmission obscured by overlays], at the proper time transmission stations can transmit said set information outside the conventional

transmission [a program originating studio may transmit said set information, for example, in a satellite side lobe of the transponder transmission transmitting the conventional transmission, and a cable head end intermediate transmission station transmits it in a separate television channel or in a transmission in a multiplexed FM frequency spectrum transmission].)

(CX 2 at col. 258, lns. 22-42) (emphasis added). Hence, while the specification teaches that signals need not be “embedded” in a “television program transmission” the alternatives are for the signal to be embedded “in” another transmission, such as embedded “in a satellite side lobe of the transponder transmission” or embedded “in a separate television channel” or embedded “in a multiplexed FM frequency spectrum transmission.”

Based on the language of claim 6, and the ‘277 specification, the administrative law judge finds that a “predetermined signal in a television program transmission” must be a predetermined signal “embedded” in a “television transmission.”

The administrative law judge finds that the prosecution history does not contain any discussion of “in a television program transmission” as that phrase is used in claim 6. The administrative law judge also finds extrinsic evidence unnecessary to understand the meaning of the phrase “in a television program transmission” as he finds no remaining ambiguity in that phrase after his review of intrinsic evidence. However, the administrative law judge may also look to expert testimony to gain an understanding of the technology in issue.²⁶ Based on his review of the expert testimony, he finds that said testimony confirms the above definition of “in a television program transmission.” For example, respondents’ expert Schreiber, testified that “predetermined signals” as used in claim 6 refers to “the digital data that is embedded in the analog television program.” (Schreiber, Tr at 1396).

²⁶ See Vitronics, 90 F.3d at 983, 34 U.S.P.Q.2d at 1332-33.

Respondents have argued regarding the phrase “predetermined signal in a television program transmission” that “claim 6 only covers the identification of digital information embedded in analog television signals (i.e. in a television transmission), each modulated on a separate carrier.” (BRCFF 225A). The administrative law judge finds that this argument is not supported by the language of other claims in the ‘277 patent. Thus, claim 5 requires, inter alia, “a line receiver for receiving a video signal of an analog television transmission and selecting portions of one or more lines of said video signal containing embedded signals” (emphasis added). Claim 8 reads in relevant part “a filter for receiving one of either video or audio of an analog television transmission and selecting portions of said analog transmission that contain digital signals” (emphasis added). Claim 16 reads in part “A system for locating an embedded instruct-to-decrypt signal out of a plurality of signals embedded in the video of an analog television transmission” and claim 21 contains the phrase “selected analog television transmission,” (CX 2 at col. 311, ln. 61 - col. 312, ln. 28) (emphasis added). The administrative law judge finds that the repeated use of the phrase “analog television transmission” in other claims of the ‘277 patent is strong evidence that the claim 6 phrase “television program transmission,” which does not contain the word “analog” is not limited to an “analog” television program transmission. See Marsh-McBirney, supra.

The administrative law judge finds further that the interpretation of “television program transmission,” as not limited to an analog transmission, is also supported by the ‘277 patent specification. Thus, the specification of the ‘277 patent teaches an example #7 wherein:

In example #7, the program originating studio that originates the “Wall Street Week” transmission transmits a television signal that consists of so-called

"digital video" and "digital audio," well known in the art.

* * *

. . . . said program originating studio embeds in the audio portion and transmits a particular SPAM message that consists of a "01" header, execution segment information that matches said enable-WSW-programming information, particular meter-monitor information, particular 1st-stage-enable-WSW-program instructions as the information segment information, and an end of file signal. (Hereinafter said message is called the "1st-WSW-program-enabling-message (#7).")

(emphasis added). Thereafter, the specification provides regarding embedding SPAM signals:

SPAM signals can be embedded in many different locations in electronic transmissions. In television, SPAM signals can be embedded in the video portion or in the audio portion of the transmission. In the video portion, SPAM signals can be embedded in each frame on one line such as line 20 of the vertical interval, or on a portion of one line or on more than one line, and they will probably lie outside the range of the television picture displayed on a normally tuned television set. SPAM signals can be embedded in radio audio transmissions. In the audio of television and radio transmissions, SPAM signals will probably be embedded in a portion of the audio range that is not normally rendered in a form audible to the human ear. In television audio, they are likely to lie between eight and fifteen kilohertz. In broadcast print and data communications transmissions, SPAM signals can accompany conventional print or data programming in the conventional transmission stream.

(CX 2, '227 patent at col. 48, ln 52 - col. 49, ln. 2) (emphasis added). The '277 patent thus teaches a SPAM signal that is "embedded" in a "television signal that consists of so-called 'digital video' and 'digital audio'." Accordingly, the administrative law judge finds, contrary to the argument of respondents, that the phrase "in a television program transmission" in claim 6 is not limited to a digital signal embedded in an analog television

transmission, but would also cover a "predetermined signal" transmitted in a television signal that consists of so-called "digital video" and "digital audio."²⁷

3. "Plurality Of Signal Types"

Complainant argued that "a plurality of signal types includes audio, video and control signals." (CFF 162).

Respondents argued that the phrase "signal type" in claim 6 "should be construed to refer to some physical characteristic of the transmitted signal. Examples of different physical characteristics include the way a digital signal differs from an analog signal, different analog modulation scheme (like amplitude modulation (AM) or frequency modulation (FM)), or different digital modulation schemes (like NRZ (non-return-to-zero) or QPSK (quaternary phase shift keying))." (BRBr at 105-106). Respondents also argued:

²⁷ The citation to "so-called 'digital video' and 'digital audio,' well known in the art," and the description thereof is not found in the '490 specification. Thus, it is new matter that was added to the '277 patent specification through the filing of the continuation-in-part application on September 11, 1987. (FF 89). Because the description of "so-called 'digital video' and 'digital audio,' well known in the art," is relied on by complainant and the administrative law judge to interpret the claim 6 phrase "separately defined from standard analog video and audio television," the administrative law judge finds that claim 6 is only entitled to a priority date of the continuation in part application Ser. No. 96,096, which is September 11, 1987.

Complainant, in its posthearing briefs and proposed findings, frequently refers to the specification of the '490 patent to support its position. See e.g. CBr at 23, 44. In issue, however, are claims 6, 7 and 44 of the '277 patent, not any claims of the '490 patent. Moreover, while the '490 patent issued on September 15, 1987 from Application Ser. No. 317,510 filed November 3, 1981 claims 6, 7 and 44 in issue are from Ser. No. 56,501 filed May 3, 1993 (FF 21) and were not added to Ser. No. 56,501 until July 14, 1993. The record does establish that Ser. No. 317,510 is the first of a chain of applications that led to the '277 patent (FF 22). However, the specification of the '277 patent is based on a 557 page specification which originated from Ser. No. 96,096 filed September 11, 1987, in contrast to the 44 page specification for the '490 patent, which originated from Ser. No. 317,510 filed November 3, 1981 (FF 22, 89). Hence, for claim interpretation, the administrative law judge has looked at the specification of the '277 patent, not the specification of the '490 patent. See also section VIII, infra.

[Judge Luckern]: Mr. Touton, what's wrong with the interpretation that Complainant wants me to give to "signal types" and to the phrase "plurality of signal types"?

MR. TOUTON: Well, the main thing that's wrong is it makes this phrase, which appears to me to be a limitation — it deprives it of any limiting effect. Taken to its logical conclusion, I suppose they would say a television picture showing a man is a different signal type than a television picture showing a woman. That seems like that can't be what the claim means.

(Tr at 3716). The staff argued that the claim 6 phrase "plurality of signal types" "appears refer to different functional types of signals, such as video, audio, various types of control-type signals, and data" noting that respondents interpretation of "signal types" as signals that differ physically, rather than functionally, such as by format (i.e., analog or digital), or by varying modulation techniques "finds little support in the specification of the '277 patent. For instance, there is no discussion of modulation techniques in the patent, so is unlikely that the claim language is intended to refer to modulation techniques." (SBr at 24).

Looking at the claim language, claim 6 requires a "plurality of signal types" which signals are transmitted "in a television program transmission." The ordinary meaning of "plurality" is simply more than one. See Webster's at 1745. Moreover, the ordinary meaning of "type" in this context is "d: something felt to be distinguishable as a variety or kind : SORT <a new ~ submarine>." Id. at 2476. The administrative law judge discussed the plain meaning of the word "signal" under "predetermined signal," supra. Thus, the administrative law judge finds the ordinary meaning of "plurality of signal types" based on the dictionary meaning of said words, is directed to two or more signals that are "felt to be distinguishable as a variety or kind." Id.

Other claims in the '277 patent also use the phrase "plurality of signal types." Claim

24 reads:

24. A method for causing decryption of television or computer programming at a station that includes a decryptor for receiving and decrypting at least part of an encrypted programming transmission in response to information of an instruct-to-decrypt signal; a digital detector for detecting data of a plurality of signal types in a mass medium programming transmission and transferring said data to a processor; and a processor operatively connected to said decryptor and said detector for locating or identifying an instruct-to-decrypt signal in said data and transferring information of said signal to said decryptor, with instruct-to-decrypt signals being of a signal type and being transmitted in said transmission in varying locations or in a varying pattern of timing, said method comprising the steps of:

programming said processor with information of a procedure for identifying an instruct-to-decrypt signal in a plurality of signal types or for locating instruct-to-decrypt signals that are transmitted in varying locations or in a varying pattern of timing;

transmitting instruct-to-decrypt signals to said station in varying locations or a varying pattern of timing in a mass medium programming transmission that contains a plurality of signal types;

receiving said programming transmission and transferring at least a portion of said transmission to said detector;

detecting data of said plurality of signal types and transferring said data to said processor; and

processing said data to locate or identify an instruct-to-decrypt signal, and identifying or locating at least one instruct-to-decrypt signal, thereby to enable said station to decrypt at least a part of an encrypted programming transmission in response to information of said signal.

(CX 2 at col. 317, lns. 29-63) (emphasis added). Thus, claim 24 refers to

"instruct-to-decrypt signals being of a signal type". The phrase "instruct-to-decrypt"

modifies the word "signal," and identifies the information content of the signal, i.e. "instruct to decrypt" information. Claim 41 uses a slightly different phraseology, and refers to a

“plurality of types of signals” making reference to “identification signals” as one “type of signal” and “instruct-to-decrypt signals” as being an alternate “type of signals.” For example, claim 41 reads:

A system for processing a television program transmission in which a plurality of types of signals including identification signals or instruct-to-decrypt signals are transmitted, said types being transmitted in different patterns and at least one of said types being transmitted in varying locations or in a varying pattern of timing in said program transmission, said system comprising:

a processor for identifying and transferring to a computer an instruct-to-generate signal that causes said computer to generate a portion of the video information content of a television program to be displayed at a television display device.

(CX 2, col. 322, lns. 45-57)(emphasis added). In addition, claim 42 reads:

42. A system for processing a television program transmission in which a plurality of types of signal information are transmitted in different patterns, with said types of signal information including at least a unit identification information signal that identifies a unit of information associated with a television program, with said signal types being transmitted in varying locations or in a varying pattern of timing in said program transmission, said system capable of processing television programming separately defined from standard analog television, said system comprising:

a processor for locating or identifying and transferring to a computer an instruct-to-generate-and-transmit signal that causes said computer to generate and transmit to a television display a portion of the video information content of a television program.

(CX 2, col. 322, ln. 58 - col. 323, ln. 6) (emphasis added). Thus, claim 42 refers to “types of signal information including at least a unit identification information signal” as “said signal types.”

The administrative law judge finds that said usage of “plurality of signal types” in claim 24, “plurality of types of signals” in claim 41, and “plurality of types of signal information” and “said signal types” in claim 42 provide examples of signals that are

identified as "types" based on their information content. For example, an "instruct-to-decrypt signal," is one "signal type" (see claim 24), "identification signals" are a "signal type" that is distinct from "instruct-to-decrypt signals" (claim 41) and "unit identification information signal" is also a "signal type" (claim 42).

Accordingly, the administrative law judge finds that other claims in the '277 patent define "signal types" based on their information content, and that a "plurality of signal types" requires signals with two or more distinct types of information.

Referring to the specification, there is no antecedent usage of the phrase "plurality of signal types" or of "signal types" in the '277 specification. Moreover, the prosecution history is found to contain no discussion of "plurality of signal types" as that phrase is used in claim 6.

The administrative law judge finds extrinsic evidence unnecessary to understand the meaning of the phrase "plurality of signal types" as he finds no remaining ambiguity in that phrase after his review of intrinsic evidence. However, the administrative law judge may also look to expert testimony to gain an understanding of the technology in issue.²⁸ Based on his review of the expert testimony, he finds that said testimony confirms the above definition of "in a television program transmission." For example, respondents' expert Schreiber testified that "plurality of signal types" could refer to signals of varying content, and that the patent specification addresses different types of signals in terms of their content. (Schreiber, Tr at 1409). Moreover, Schreiber testified that one could assume "plurality of signal types" referred to signals of different content because the patent is "talking about hiding signals,

²⁸ See Vitronics, 90 F.3d at 983, 34 U.S.P.Q.2d at 1332-33.

where they can be hidden and all, it's assumed that you have video and audio. And of course, there's data that's embedded. So if you go by content, then the normal system used in the patent has at least three different signal types." (Schreiber, Tr at 1555-56).

Respondents have pointed to nothing in the specification, and the administrative law judge has found nothing in the specification, that would support respondents' proposed construction of the phrase "plurality of signal types" as requiring signals with differing physical characteristics. (BRBr at 105-106). To the contrary, as detailed supra, other claim of the '277 patent make clear that "plurality of signal types" requires signals of different information content type. Accordingly, the administrative law judge rejects respondents' argument that "signal types" requires signals that differ physically or requires signals with different physical characteristics as contrary to the intrinsic evidence of record.

4. "Separately Defined"

Complainant argued that the claim phrase "separately defined from standard analog video and audio television" in claim 6 "defines the transmission being operated on by the system of claim 6 as something different from the standard analog television transmission." (CRBr at 5). Respondents argued that "if meaning is to be given to the phrase 'separately defined from standard analog video and audio television' by referring to the specification, it should be limited to cover a conventional analog transmission of video and audio signals on carrier (i.e. standard analog television) with the addition of digital data embedded in the transmission." (BRBr at 19).²⁹ The staff argued that "claim 6 is attempting to describe a

²⁹ Respondents conceded that "the plain meaning" of the phrase "separately defined from standard analog video and audio television" in claims 6 and 7 "would suggest that it covers anything that is not standard analog video and audio television," while arguing that the claim phrase is indefinite because "the alleged invention of the '277 patent is directed to embedding digital data in

television transmission that contains something in addition to the standard television signal.” (SBr at 24).

Referring to the claim language the administrative law judge finds that the ordinary meaning of “separately defined from standard analog video and audio television” in claim 6 would be a “television program transmission” that is not “standard analog video and audio television.”

Other claims in the ‘277 patent use the phrase “separately defined from standard analog video and audio television.” For example, claim 8 requires a “filter for receiving . . . an analog television transmission and selecting portions of said analog transmission that contain digital signals,” and also requires “a second digital detector for receiving information of a selected television program transmission that is separately defined from standard analog television, said digital detector detecting a second digital signal in said separately defined television program transmission” (CX 2 at col. 313, lns. 1-14) (emphasis added). See also claim 7 in issue, *infra*. Thus, the administrative law judge finds that the language of claim 6, as well as the language of other claims in the ‘277 patent support a finding that the claim 6 phrase “separately defined from standard analog video and audio television” requires a “television program transmission” that is not “standard analog video and audio television.”

The administrative law judge finds that the ‘277 specification does not use the phrase “separately defined from standard analog video and audio television.” However, at column 21, lns 62-66, the ‘277 patent specification makes a reference to “the separately defined

standard analog video and audio television and extracting it for various reasons at the receiver.” (BFF 938).

transmission," in relation to the input on "Path C" of Figure 2A. In lines 26-61 of column 21, the '277 patent talks about path A to detect "signal information" embedded in the video and path B to detect signal information embedded in the audio. Path C in Figure 2A of the '277 patent clearly shows the detection of a predetermined signal in a broadcast transmission other than video (Path A) or audio (Path B). (CX 2 at Fig. 2A). Column 21, lines 62-66 of the '277 patent describe Path C of Figure 2A as one which "inputs the separately defined transmission to a digital detector, 38, which detects signal information embedded in any other information portion of said television channel signal" (CX 2 at col. 21:62-66).

Thus, the '277 patent states:

The third path, designated C, inputs the separately defined transmission to a digital detector, 38, which detects signal information embedded in any other information portion of said television channel signal and inputs detected signal information to controller, 39.

(CX 2, col. 21, lns. 62-66). The administrative law judge finds that the specification of the '277 patent supports the ordinary meaning of "separately defined from standard analog video and audio television" in claim 6 as directed to a "television program transmission" that is not "standard analog video and audio television."

Referring to the prosecution history, it is found that said history of the '277 patent does not contain any discussion of the phrase "separately defined from standard analog video and audio television." The administrative law judge also finds extrinsic evidence unnecessary to understand the meaning of the phrase "separately defined from standard analog video and audio television."

Respondents have argued that the claim phrase "separately defined from standard analog video and audio television" must be limited to cover a conventional analog video and

audio television transmission with digital data embedded, and should not cover a purely digital transmission. (BRBr at 19). The specification contains a description of analog video and audio television program transmissions with digital data embedded therein (CX 2, '277 patent at col. 48, ln. 52-col. 49, ln. 2), as well as example # 7 in the '277 patent, which discloses transmitting SPAM signals in a digital video and digital audio television program transmission. (CX 2, col. 162, ln. 16 to col. 174, ln. 51). Specifically, the specification provides:

In example 7, the program originating studio that originates the "Wall Street Week" transmission transmits a television signal that consists of so-called "digital video" and "digital audio," well known in the art.

(CX 2, '277 patent col. 162 lns. 16-19).

Based on the foregoing, the administrative law judge finds that, because the specification of the '277 patent contains a reference to "so-called 'digital video' and 'digital audio,' well known in the art," which is not "standard analog video and audio television," the claim 6 phrase "separately defined from standard analog video and audio television" includes "so-called 'digital video' and 'digital audio'" television program transmissions as well as analog video and audio television transmissions with digital data embedded therein.

5. "Digital Detector" - A Means Plus Function Element

Claim 6 also requires a "digital detector for receiving said transmission and detecting said predetermined signal in said transmission based on either a specific location or a specific time." Complainant argued that a "digital detector" as that phrase is used in claim 6 should be interpreted to require "a circuit for extracting a digital signal from a larger transmission . . ." (CBr at 26). Respondents argued that the "digital detector" of claim 6 should be

interpreted under 35 U.S.C. § 112 sixth paragraph, or as a “means-plus-function” element, i.e. a means for detecting a digital signal. (BRBr at 92-96).

The staff argued that “the general purpose of the digital detector is the detection of some sort of digital information in a larger transmission. . . .” (SBr at 25-26). The staff also argued that “digital detector” is properly interpreted as a “means plus function” element under 35 U.S.C. § 112, paragraph 6, and that the “digital detector describes the element solely in terms of the function it performs, and connotes no actual structure.” (SBr at 71).

The broadcasting respondents argued that there is no “definite structure” by which the function of the “digital detector” element recited in claim 6 in issue (as well as in claims 7 and 44) in issue is to be accomplished and accordingly the “digital detector” element is in 35 U.S.C. § 112 sixth paragraph format. (BRBr at 96). It is argued that the evidence is not only overwhelming, but it’s uncontroverted, that there is no particular structure that the phrase “digital detector” conveys as a way of performing the function of detecting digital information in another signal, which is what comes after “for” in the claim elements at issue here. (Tr at 1727, 1728).

Complainant argued that the fact that “digital detector” is defined in functional terms in claim 6 does not convert that claim element into a means-plus-function claim under 35 U.S.C. §112, sixth paragraph. It is argued that, looking at the traditional sources of information from which to interpret claims, viz. the language of the claims of the patent in issue, the specification and the file history, there is no basis to suggest that the inventors intended to claim the “digital detector” element in a means-plus-function format nor to depart from the “general rule” that the absence of “means” language takes the “digital detector”

recitation in claim 6 as well as claims 7 and 44 outside the scope of section 112, sixth paragraph. (CRBr at 43, 46, 47). Complainant also argued, in response to the staff's argument that the experts defined "digital detector" in terms of functionality; and that the staff's argument "is factually incorrect because complainant's expert Williams specifically testified that a digital detector as claimed would have a tuner, a demodulator, and some type of bit comparator (CFF 172), and that complainant's expert Davis agreed with this testimony, Davis, Tr at 3179-80." (CRBr at 48-49).

35 U.S.C. § 112, sixth paragraph reads:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, materials, or acts described in the specification and equivalents thereof.

While the Court in Greenberg v. Ethicon Endo-Surgery, Inc. 91 F.3d 1580, 39 U.S.P.Q.2d 1783 (Fed. Cir. 1996) (Greenberg), concluded that the use of the term "means" "generally invokes section 112(6) and that the use of a different formulation generally does not", the administrative law judge finds that there is no general rule to that effect nor that and intent of the inventors should be controlling.³⁰ Rather as the majority opinion found in the later

³⁰ As the staff argued in its initial brief (SBr at 72, 73), there are several examples of cases where claim elements without the traditional terms of "means for" were found to be within the scope of section 112, paragraph 6. In Application of Attwood, 354 F.2d 365 (C.C.P.A. 1966), the Court of Customs and Patent Appeals, in an opinion by Judge Rich, found the following claim element to be the type of limitation permitted under section 112, paragraph 6 (then paragraph 3):

In an elongated unitary load-supporting metal frame member for an adjustable metal framing construction,

* * *

(continued...)

decided Cole v. Kimberly-Clark Corp., 102 F.3d. 524, 41 U.S.P.Q.2d 1001 (Fed. Cir. 1996), petition for cert. filed May 19, 1997 (Cole), merely because an element does not include the word "means" does not automatically prevent that element from being construed as a means-plus-function element. It further found that 35 U.S.C. §112, sixth paragraph is invoked when the alleged means-plus-function claim element does not recite a definite structure which performs the described function, and that the issue of whether a claim element is a means-plus-function claim element, and 35 U.S.C. §112, sixth paragraph applies, must be decided on an element-by-element basis, based upon the patent and its

³⁰(...continued)

said knock-outs when removed providing optional holes for the attachment of additional frame members to said frame member.

Attwood, 354 F.2d at 367, 373-74. In Ex parte Stanley, 121 U.S.P.Q. 621, 627-28 (Pat. Off. Bd. App. 1958), the Board of Patent Appeals considered the claim limitation of "a jet driving device so constructed and located on the rotor as to drive the rotor at a blade tip speed of the order of 680 to 760 feet per second" to be a functional element within the boundaries of section 112, paragraph 6. The Board noted that:

Under the particular circumstances of the present case the term "device" with respect to its significance and coverage is synonymous with the term "means," in these claims to the apparatus.

Ex parte Stanley, 121 U.S.P.Q. at 627. See also Kochum Industries, Inc. v. Salem Equipment, Inc., 467 F.2d 61, 63-64 (9th Cir. 1972), cert. denied, 411 U.S. 964 (1973) (terms "relatively sharp edge" and "log-impactible edge" with additional functional descriptions in claims are within section 112, last paragraph); Bryan v. Sid W. Richardson, Inc., 254 F.2d 191, 194 (5th Cir. 1958) (section 112 permits use of "equivalent synonyms" to the word "means").

In Raytheon Co. v. Roper Corp., 724 F.2d at 951, neither the word "means" nor the phrase "means for" appeared in a claim element and various associated structures were set forth. The Federal Circuit, however, interpreted the claim element to be "the equivalents of one specifying as an element in the claim 'means for continuing convection during autoignition'." Also the term "double-drive mechanism" was found to be a means-plus-function element in Haney v. Timesavers, Inc., 29 U.S.P.Q.2d 1605, 1608 (D. Ore. 1993).

prosecution history. Cole, 102 F.3d at 531, 41 U.S.P.Q.2d at 1007.³¹

Referring to the language of claim 6, said language requires a “digital detector for receiving said [television program] transmission and detecting said predetermined signal in said [television program] transmission based on either a specific location or a specific time.” The term “digital detector” is also used in claims 7 and 44 in issue. In addition, each of claims 4, 5, 8, 10, 12, 13, 16, 17, 20, 24, 25, 26, 46, 48, 50, 51, 52, and 53 of the ‘277 patent recites a “digital detector.”

At closing arguments, the administrative law judge referred to certain dictionary definitions of “detector,” “digital” and “digital circuit.” (Tr at 3728, 3729).³² Thus he indicated that the McGraw Hill Dictionary of Scientific and Technical Terms 4th ed defines “detector” as:

[ELECTR] The stage in a receiver at which demodulation takes place; in a superheterodyne receiver this is called the second detector. Also known as demodulator; envelope detector.

Id. at 518;³³ and that McGraw Hill contains a definition of “digital” as “[p]ertaining to data in the form of digits” and defines “digital circuit” as:

³¹ In Cole while the patentee argued that the claimed “perforation means . . . for tearing” element was a “means-plus-function” element under 35 U.S.C. §112, paragraph 6, and hence that it was the patentee’s intent that it be so construed, the district court and the majority in Cole found otherwise. Cole 102 F. 3d at 527, 532, 41 U.S.P.Q.2d at 1008.

³² As the administrative law judge stated at closing arguments (Tr at 3728) Greenberg relied on dictionary definitions, 91 F.3d at 1583, 39 U.S.P.Q.2d at 1787.

³³ Under “demodulator” McGraw Hill states “See detector.” and defines “demodulate” as “[COMMUN] To recover the modulating wave from a modulated carrier. Also know as decode; detect.” Id. at 508.

[ELECTR] A circuit designed to respond at input voltages at one of a finite number of levels and, similarly, to produce output voltages at one of a finite number of levels.

Id. at 539. The administrative law judge is unaware, and the parties did not identify, any dictionary definition for the entire phrase "digital detector."

Complainant argued as follows regarding the dictionary definitions of "detector" and "digital" and "digital circuit" detailed supra:

MR. TAYLOR: I think that dictionary definition, your Honor, is very similar to what Dr. Williams testified one would expect to find in a digital detector. If you go back to Williams's testimony right at the end of the case, I asked him a number of questions on direct examination, so we're perfectly happy to have your Honor follow the procedure that the Federal Circuit followed in Greenberg.

(Tr at 3730). Thereafter, respondents' counsel argued as follows:

MR. TOUTON: Two comments about it. First, it's an interesting definition.

JUDGE LUCKERN: I'm not saying that I'm going to precisely use this. I may find another dictionary definition. I may take judicial notice of dictionary definitions, whatever it is, but I just want that to be clear.

MR. TOUTON: Absolutely, and I think it's proper for you to do so, but I would comment to you – you've said you read Dossel more times than a person should be required, and if you follow that, you'll notice a particular methodology that the Federal Circuit seems to be using in analyzing that, and that is, the first thing they seem to look at is the functions stated in the element, that is the words that appear after "for," so you've got an idea of the function of this thing. And they consider whether the thing itself, your digital detector, places any structural limitations on the way to go about doing that.

And I would suggest that combining the definition of "detector" shown in that dictionary with the definition of "detect," which is defined to demodulate, then the definition of detector would place nothing other than the functional limitations on what the device is doing. It doesn't really say how it's doing it, doing the functions stated in the claim.

In other words, in Dossel, it was a means for reconstituting some signal, or something like that, and they said okay, reconstituting, how do you go about

reconstituting. Of course, there you had a means, but the inquiry ought to be what appears before the "for" word provides some limitation on the structure that performs the function appearing after the "for" word.

(Tr at 3730-3732) (emphasis added). In addition, the staff argued as follows:

JUDGE LUCKERN: Mr. Brittingham, do you have any comments to make with respect to the dictionary definition and anything you heard Mr. Taylor and Mr. Touton say?

MR. BRITTINGHAM: Your Honor, a couple things. First, the dictionary definition relates to the term "detector." It doesn't specifically relate to the term "digital detector," and my recollection of your recitation of the definition of "digital," it either was a circuit in utilizing digital techniques or a circuit with an input of digital information and an output of digital information.

JUDGE LUCKERN: The dictionary definition here of digital circuit is -- and I'm reading -- "a circuit designed to respond at input voltages at one of a finite number of levels and, similarly, to produce output voltages at one of a finite number of levels." That's the way digital circuit is defined in this dictionary.

MR. BRITTINGHAM: I slightly misspoke, but if I understand that, the discussion of finite levels indicates that the input and output are digital signals rather than analog signals, and I think that you're going to have some difficulty combining that with the definition of detector which talks about it being a demodulator. And in the sense of a demodulator, we generally think of as an analog signal carrying some additional information and then the demodulation technique is the removal of that information from the analog carrier. And that information that's being removed might be digital; that is, discrete voltages or it might be a separate analog signal. So we still have certain confusion as to what "digital detector" is meant to mean, since combining the word "digital" with "detector" doesn't necessarily fit.

The other thing I was going to say, what struck me is I don't necessarily consider that definition to be all that consistent with what Dr. Williams was testifying to. Ron Williams, because I think to a large extent, he was suggesting a digital detector would have a tuner, a demodulator, and a bit comparator or some other digital processing device; whereas the definition we're seeing there is simply the demodulation function. And therefore, it appears that Dr. Williams may be describing a more complex device.

What it did actually sounds a lot like was Mr. Davidson's testimony when he stated, in the IF amplifier and detector circuit in his invention, that he used an envelope detector, and in fact, his testimony specifically was the term

"detector" is the same as demodulator as he was using it. This is at RX 1006.

As he indicated, a "detector" is another word for "demodulator," and that's at page 87 of his deposition. And then later on, at page 88, he testified that he chose an envelope detector because, in the particular instance he was discussing, the signal was amplitude modulated; that is, it was an AM signal rather than, for example, an FM signal.

Again, we're talking about a device which may or may not -- in my view, does not -- parallel the digital detectors of the '277 patent which have vastly more capabilities, if you're looking at what the claims are asking him to do and what is being suggested in what little explanation there is in the specification.

I think looking at the definition is obviously permissible. It may add information that we, at this point, haven't presented here, but it's one source of information. It's not the only source, and it also has to be combined with the testimony of Dr. Ciciora, Dr. Crowther and Dr. Schreiber. All of them testified that the term "digital detector" simply was not one they were aware of being used in the field and is not one that connoted a particular structure.

Even if you take the definition in the dictionary -- and unfortunately, we never had testimony on this issue because the hearing is over -- it's unclear whether discussing it as a demodulator is sufficiently clear such that we would all now understand a certain structural component or class of components. Even that is not necessarily divorced from its functional underpinnings.

(Tr at 3732-3735) (emphasis added). Webster's Third New International Dictionary at 616 defines "detector" as "*e radio* (1) : a device for determining the presence of a signal (2) : a rectifier of high-frequency current (as a cat whisker and crystal or a vacuum tube) (3) : a device for extracting the intelligence from a signal (4): DEMODULATOR 1." Thus, the ordinary, dictionary meaning of "detector" in claim 6 could include a "demodulator," or it could include "a device for determining the presence of a signal" or "a rectifier of high-frequency current" or "a device for extracting the intelligence from a signal." Consistent with the staff's argument at closing arguments, the administrative law judge finds that any dictionary definitions of "detector," "digital" and "digital circuit" do not resolve the question

of whether the entire phrase “digital detector” conveys a specific structure to one of ordinary skill in the art.

Looking to other claims in the ‘277 patent that use the phrase “digital detector,” the administrative law judge finds support for respondents’ and the staff’s argument that “digital detector” does not convey any specific structure, but instead is in means plus function form. Thus, there are many claims that use the phrase “digital detector” in different contexts with different, mutually exclusive relationships to other claim elements. In addition, different claims require the claimed “digital detector” to perform different functions that would require a different device.

For example, claims in the ‘277 patent require an “operative” connection between a “digital detector” and a variety of other claim element. Claim 4 requires a “digital detector” that is “operatively connected to said switch. . .” (CX 2, ‘277 patent at col. 311, lns. 57-60). Claim 5 requires a “first digital detector operatively connected to said line receiver . . .”³⁴ and a “second digital detector operatively connected to said filter. . .”³⁵ (CX 2, ‘277 patent at col. 311, ln. 66- col. 312, ln.11). Claim 10 requires a “digital detector operatively connected to said receiver. . .” (CX 2, ‘277 patent at col. 313, lns. 33-35). Claim 20 requires a “digital detector operatively connected to said decryptor. . .” (CX 2, ‘277 patent at col. 316, lns. 23-28). Claim 44 in issue requires a “digital detector operatively connected to a mass medium receiver. . .”^{36, 37} Similarly, “digital detector” required in other claims

³⁴ Claim 16 also requires a “digital detector operatively connected to said line receiver . . .”

³⁵ Claim 8 also requires a “first digital detector operatively connected to said filter. . .”

³⁶ Claims 48, 50, 52 and 53 require a “digital detector operatively connected to a mass
(continued...)

have different inputs and different functional requirements. Thus, claim 4 not in issue requires a "digital detector" that is "for detecting digital data in said selected [broadcast or cablecast] transmission and for relaying said data to a data processor." (CX 2, '277 patent at col. 311, lns. 57-60) [Emphasis added]. Claim 5, not in issue, requires a "first digital detector . . . for receiving the selected portions of video lines containing the video embedded signals and detecting the presence of a first predetermined signal in said selected lines of video;" and also requires a "second digital detector . . . for receiving the selected portions of the audio signal containing the audio embedded signals and detecting the presence of a second predetermined signal in said selected portions of said audio signal," (CX 2, '277 patent at col. 311, ln. 66- col. 312, ln. 11) (emphasis added). Claim 8 not in issue requires a "first digital detector . . . for receiving said selected portions of said analog transmission and detecting a first digital signal;" and also requires a "second digital detector for receiving information of a selected television program transmission that is separately defined from standard analog television, said second digital detector detecting a second digital signal in

³⁶(...continued)
medium receiver. . ."

³⁷ Claim 51 requires a "digital detector operatively connected to a means for detecting digital information in a specific transmission. . ." [emphasis added] Hence, this phrase of claim 51 has two distinct elements, a "digital detector" and a "means for detecting digital information." The "digital detector" in claim 51 must apparently accomplish some unspecified function, other than "detecting digital information in a specific transmission," which is accomplished by the "means for detecting digital information." However, this usage is inconsistent with other claims in the '277 specification, for example claims 44, 46, 48 and 50, wherein a "digital detector" must perform exactly the function of the "means" in claim 51, viz "detecting digital information." Thus, in some claims a "digital detector" accomplishes the function of "detecting digital information," while in claim 51, the "digital detector" must be "operatively connected" to a "means for detecting digital information" implying that the "digital detector" of claim 51 does not "detect digital information." This is further evidence that the phrase "digital detector" can not be understood to provide any structural limitation to claims 6, 7 and 44 in issue, and must be read as a means for accomplishing the specified function set forth in each of those claims.

said separately defined television program transmission.” (CX 2, ‘277 patent at col. 313, ins. 5-14) (Emphasis added). Claim 7 in issue requires a “digital detector” that is “for receiving at least some information of said [television program] transmission and detecting said specific signal. . .” (Emphasis added). Claim 44 in issue requires a “digital detector that is “for detecting digital information in a mass medium transmission and transferring some of said information to a processor.”

Hence, “digital detector” element must alternately function to receive, inter alia, (1) an entire “broadcast” or “cablecast” transmission (claim 4), (2) “selected portions of video lines” (claim 5), (3) “selected portions of the audio signal” (claim 5), (4) an entire “television program transmission” (claim 6), (5) “at least some information of a television program transmission” (claim 7) and (6) a “mass medium transmission” (claim 44). The administrative law judge finds that the alternative functions of the phrase “digital detector” in claims of the ‘277 patent is additional evidence that the language “digital detector” in each of claims 6, 7 and 44 in issue does not refer to any one specific structure, but instead is directed only to a means for accomplishing the function of detecting digital information in a given transmission.

The administrative law judge finds that the ‘277 specification provides further evidence that the phrase “digital detector” does not refer to any specific structure. See Cole, supra. While the specification contains an antecedent usage of the exact phrase “digital detector,” it is found that the specification does not expressly define the phrase “digital detector.” Rather, the specification uses the phrase “digital detector” to describe a functional

part of a variety of disclosed apparatus. As an example, the specification contains the following description of "Signal Decoders:"

Signal decoder apparatus such as decoder, 203, in FIG. 1 and decoders, 30 and 40, in FIG. 2 are basic in the unified system of this invention.

FIG. 2A shows a TV signal decoder that detects signal information embedded in an inputted television frequency, renders said information into digital signals that subscriber station apparatus can process, identifies the particular apparatus to which said signals are addressed, and outputs said signals to said apparatus. Decoder, 203, in FIG. 1 is one such TV signal decoder; decoder, 30, in FIG. 2 is another.

In FIG. 2A, a selected frequency is inputted at a fixed frequency to said decoder at filter, 31, which defines the particular channel of interest to be analyzed. The television channel signal then passes to a standard amplitude demodulator, 32, which uses standard demodulator techniques, well known in the art, to define the television base band signal. This base band signal is then transferred through separate paths to three separate detector devices. The apparatus of these separate paths are designed to act on the particular frequency ranges in which embedded signal information may be found. The first path, designated A, detects signal information embedded in the video information portion of said television channel signal. Path A inputs to a standard line receiver, 33, well known in the art. Said line receiver, 33, receives the information of one or more of the lines normally used to define a television picture. It receives the information only of that portion or portions of the overall video transmission and passes said information to a digital detector, 34, which acts to detect the digital signal information embedded in said information, using standard detection techniques well known in the art, and inputs detected signal information to controller, 39, which is considered in greater detail below. The second path, designated B, detects signal information embedded in the audio information portion of said television channel signal. Path B inputs to a standard audio demodulator, 35, which uses demodulator techniques, well known in the art, to define the television audio transmission and transfers said audio information to high pass filter, 36. Said filter, 36, defines and transfers to digital detector, 37, the portion of said audio information that is of interest. The digital detector, 37, detects signal information embedded in said audio information and inputs detected signal information to controller, 39. The third path, designated C, inputs the separately defined transmission to a digital detector, 38, which detects signal information embedded in any other information portion of said television channel signal and inputs detected signal information to controller, 39. Line receiver, 33; high pass filter, 36; detectors, 34, 37, and 38; and controller,

39, all operate under control of controller, 39, and in preprogrammed fashions that may be changed by controller, 39.

(CX 2, col. 21, ln. 16 - col. 22, ln. 2) (emphasis added). Hence, the specification discloses three examples of the function of a "digital detector," in relation to Figure 2A, which is related to a television transmission. However, each of the three digital detectors disclosed in Figure 2A, and described in the specification are different in terms of required structure. Thus, Figure 2A discloses a "Path A" which "inputs to a standard line receiver, 33, well known in the art" and which "receives the information of one or more of the lines normally used to defined a television picture;" and passes "the information only of that portion or portions of the overall video transmission" to "digital detector" 34. A second "digital detector" 37 is disclosed on "Path B" which "inputs to a standard audio demodulator, 35" which "define[s] the television audio transmission and transfers said audio information to high pass filter, 36." Said "high pass filter" transfers "the portion of said audio information that is of interest" to a "digital detector" 37. A third "digital detector" 38 is disclosed in Figure 2A which receives a "separately defined transmission" on "Path C" from "standard amplitude demodulator" 32. Each of said "digital detectors" 34, 37 and 38 share a common function in that they input "detected signal information" to "controller" 39. However, each of "digital detector" 34, 37, and 38 operate on a distinct type of input, and therefore a different structure would be required for each of said "digital detectors" 34, 37 and 38.

The '277 specification also discloses a "digital detector" 43 in Figure 2B which receives an input from a "radio decoder" 42 and provides an output to a "controller" 44

The specification describes Figure 2B as follows:

FIG. 2B shows a radio signal decoder that detects and processes signal information embedded in an inputted radio frequency. Decoder, 40, in FIG. 2 is one such radio signal decoder. A selected frequency of interest is inputted; a fixed frequency to standard radio receiver circuitry, 41, which receives the radio information of said frequency using standard radio receiver techniques, well known in the art, and transfers said radio information to radio decoder, 42. Radio decoder, 42, decodes the signal information embedded in said radio information and transfers said decoded information to a standard digital detector, 43. Said detector, 43, detects the binary signal information in said decoded information and inputs said signal information to controller, 44, discussed more fully below. Circuitry, 41; decoder, 42; and detector, 43, all operate under control of controller, 44, and in predetermined fashions that may be changed by controller, 44.

(CX 2 at col. 22 lns. 3 - 20) (emphasis added). Finally, Figure 2C discloses a “digital detector” 46 receiving an input from some “other receiver circuitry” 45 that has an input “i a frequency other than a television or radio frequency” and which provides an output to a “controller” 47. The specification describes Fig 2C as follows:

FIG. 2C shows a signal decoder that detects and processes signal information embedded in a frequency other than a television or radio frequency. A selected other frequency (such as a microwave frequency) is inputted to appropriate other receiver circuitry, 45, well known in the art. Said receiver circuitry, 45, receives the information of said frequency using standard receiver techniques, well known in the art, and transfers said information to an appropriate digital detector, 46. Said detector, 46, detects the binary signal information in said information and inputs said signal information to controller, 47, considered more fully below. Circuitry, 45, and detector, 46, operate under control of controller, 47, and in predetermined fashions that may be changed by controller, 47.

(CX 2 at col. 22 lns. 21 - 35) (emphasis added).

Based on the foregoing, the administrative law judge finds that the digital detectors disclosed in the specification do not define any one specific structure. The specification discloses “digital detectors” 34, 37, 38, 43, and 46 that would each receive a different input

signal, and would require different circuitry, or a different structure. The only commonality among the disclosed "digital detector" elements 34, 37, 38, 43, and 46 is that each performs the function of "detect[ing] the digital signal information embedded in [a given transmission] . . . and inputs detected signal information to [a] controller." In summary, the specification discloses that a "digital detector" is any device that performs the function of "digital detection."

No party has relied on the prosecution history of the '277 patent in support of their interpretation of "digital detector" as a means plus function element or not as a means plus function element.

The administrative law judge finds that ambiguity remains regarding the claimed phrase "digital detector" after his review of the claim language, specification and prosecution history. Thus, he finds it appropriate to refer to extrinsic evidence on this issue.³⁸ All witnesses testified consistently that the phrase "digital detector" taken by itself does not imply any particular structure.

Complainant's expert Williams (FF 545) testified that the phrase "digital detector" taken by itself would not convey any structure to one of skill in the art. Specifically, complainant's Williams testified as follows:

³⁸ Complainant relies on the testimony of respondents' Davidson, who testified in relation to the use of "detector" in the Davidson reissue patent 31, 735:

[A] And "detector" is another word for "demodulator." It is the circuitry which removes the intelligence from the signal that had the intelligence modulated into it.

(Davidson, RX 1006 at 87). See also Webster's and McGraw Hill supra. However, in contrast to Davidson's testimony, the '277 patent discloses a "digital detector" as being a distinct component which is not the same as a "demodulator." (FF 543).

- Q I had, I believe, made reference to his earlier -- I had asked Dr. Schreiber a question at lines 3 to 5. Does digital detector, in your opinion, have a specific meaning, just the term "digital detector," a man of ordinary skill in the art said here's a digital detector. Would you know what he was talking about or would you not know what he was talking about because the phrase doesn't have any specific meaning?
- A You mean outside the context of the patent?
- Q Yes, let's try first outside the context of the patent.
- A The only thing it would mean to me is it would be some device for detecting digital information. Outside of the context of the patent and without knowing what the inputs were or the outputs, that's all it would mean.

(Williams, Tr at 3069-70) (emphasis added).

Similarly, each of respondents' experts Schreiber and Ciciora testified that the term "digital detector" has never had a specific meaning to those skilled in the art. Thus, Schreiber testified:

JUDGE LUCKERN: Isn't the term "digital detector" something that's knowledgeable to people in this art?

THE WITNESS: In my opinion, the term "digital detector" has never had a specific meaning. Now, it's obvious that it has something to do with detection. It has something to do with digits. But it certainly doesn't convey a structure, and in the case of this patent, if you look at the claims as well as the specification, it's not at all clear what the function of the digital detector is.

* * *

JUDGE LUCKERN: ... you said at page 215, line 20, "in my opinion, the term 'digital detector' has never had a specific meaning."

Of course, claim 44 does have the phrase "digital detector," that's at column 323, line 40, but are you saying that a man skilled in this art, if you use the term, forget the patent, if you use the term "digital detector," are you saying that that would not have any specific meaning

to a man skilled in the art, or are you saying here in this patent, the term "digital detector" that's at column 323, line 49, that that term doesn't have a specific meaning in the patent specification? Do you understand what I'm trying to ask you?

THE WITNESS: Yes, I think I do. Independent of the patent and this lawsuit, in my opinion, the term "digital detector" never specified ever a particular function or a particular circuit.

In connection with the patent, we can deduce, to some extent, what the digital detector is supposed to do. We look at figure 2A, for example. There is clearly labeled the digital detector, and we can tell from this diagram what the input is. As we see in the — on the TV, this is the input to the digital detector, and it comes out of the amplitude demodulator. Therefore, the signal that goes into digital detector number 38 is a baseband video signal, and that is not the case in RX 353. The signal that comes into the so-called digital detector is, in fact, a multicarrier signal with the data stream from each transponder on a separate carrier, and that's not a baseband video signal.

(Schreiber, Tr at 1538 - 1542) (emphasis added). Ciciora also testified as follows:

- A. . . . A term that leaves me absolutely without a clue is the term "digital detector." That is not a term — in fact, the '277 patent was the first time in my life that I've seen digital detector, not as an adjective for something else, but standing alone.

JUDGE LUCKERN: What do you mean not as an adjective for something else?

THE WITNESS: If you made — and I'm just reaching for an example — a digital smoke detector. If you use digital technology to implement or augment something that detected smoke or a burglar alarm, a digital detector for a burglar alarm, that would make some sense. But a digital detector, it's not specific.

JUDGE LUCKERN: So your testimony is that a digital smoke detector makes sense, but the way the phrase "digital detector" is used in this claim here doesn't make sense; is that your testimony?

THE WITNESS: My testimony would be that I don't know what a digital detector is. I couldn't, with just that information, design you one.

JUDGE LUCKERN: But it says what it is, in the sense that it says -- I'm not arguing with you. I'm trying to get an understanding in your opinion, only your opinion. But it does say "a digital detector for receiving." So it tells you what it's supposed to receive, so it's just not a digital detector. It says "a digital detector for receiving" and detecting, so there is some language in there that gives some qualification to this phrase "digital detector." Maybe I'm dead wrong, but I'm just looking at the claim that's there.

THE WITNESS: It doesn't give enough limitation. It says "a digital detector for receiving said transmission," and the transmission is separately defined. That means the transmission is defined with a negative definition. It's not analog video and audio television. It's something else, but it doesn't say what it is and therefore, because I don't know what the separate transmission is, I have no way of knowing how to detect it. I have no way of knowing what frequency is, what modulation method it might be. Is it voltages? Is it currents? Is it in ether? Is it on wire? Is it on cable?

There's no way of knowing what that separately defined from standard analog video and audio television is, so I can't begin to put pencil to paper to draw and circuit for it.

* * *

THE WITNESS: It's a valid question and you're absolutely right regarding some of the blocks [in certain Figures of the '277 patent]. There are certainly blocks on an amplitude demodulator, and there's a sound detector block, and I don't remember the exact terminology whether it said frequency demodulator or not, but if I know that it's a television signal going in there, I know how video is modulated on to a television signal, and I know that there are a half a dozen different ways of demodulating that signal, and they all work just as well, and I could pick one, and I could build it and I'd be all set.

For the path that involves an audio signal, I know how audio signals are modulated onto a television signal. I can pick a design and implement that block. There's a block there called a mixer, I believe, a block called a local oscillator. I may not be using the exact terms in the figure, but these are terms that are well understood by engineers in the art, and they would have no problem building those things.

In fact, some of them, they would go to a catalog of integrated circuits and choose one. However, when we get to the digital detector, that is

not the case. That is in stark contrast to the others because we've not used the term digital detector, number one. And number two and even more importantly, we are not told anywhere in the patent, in the claims or in the drawings, what is the nature of the signal that is separately defined from standard analog video and audio, and therefore, there is no clue that any engineer of ordinary skill or above ordinary skill could begin to put pencil to paper and say here is how I would build the contents of that block. It is completely underspecified.

* * *

Q With regard to digital detectors, what, in your opinion, would one of ordinary skill in the art in 1981 have understood — and I want you to set aside these patents we've been looking at — but just in terms of electrical engineering knowledge, what would a person of ordinary skill in the art in 1981 have understood regarding the structure of a digital detector?

A I think a person of ordinary skill in the art or a person of extraordinary skill in the art would ask you what do you mean? In this field, they would not have heard about digital detectors, and if you started the process of describing them to them, they would ask more and more questions until you very clearly specified what was the nature of the signal that the digital detector was supposed to operate on. And if you further showed that digital detector having a control input, they would want to know what the control input is supposed to do, what is it supposed to accomplish?

But I think, in short, the first reaction would be "huh"?

(Ciciora, Tr at 2459 - 2769) (emphasis added).

Respondents' Crowther testified as follows regarding the term "digital detector" as used in claims 6 and 7:

49. Why do you find the digital detector limitations of claims 6 and 7 vague and indefinite?

A. Because the term "digital detector" does not describe any particular circuitry or structure to me. I worked in the television industry my entire adult life and I have never met a digital detector. In claims 6 and 7, the digital detector is a functional term that appears to me to refer to any means for detecting digital information. Even the

description of the function is vague in my view since the word "detect" can be given a number of different meanings. A smoke detector detects fire but does nothing about it. The smoke detector merely notes the presence of the smoke. This is one sense of the word "detect." Another sense of the word "detect" involves noting the presence of the object to be detected and pulling it out for further observation. In the case of embedded digital information (which at this stage would be in an analog form), circuitry that detected digital information under this definition of the word "detect" would extract embedded digital information and convert it to a series of noughts and ones. In a third sense, the detection could involve demultiplexing of digital information in which packets of digital information are received and only certain packets are selected. While circuits could have been built to accomplish these different detection functions, it is not at all clear which of these circuits is referred to be the term "digital detector."

In the '277 patent, the digital detectors are merely shown as boxes. The boxes labeled 34 and 37 in Fig. 2A appear to be devices that locate digital information, which is in analog form, in an otherwise analog signal and convert that information to logical ones and noughts. The digital detector 38 in Fig. 2A is more mysterious because the '277 patent does not describe how information is embedded in this alternate path. I find the specification of the '277 patent to be of no help in determining what is meant by the term "digital detector."

(Crowther, RX 142, at 27 - 28) (emphasis added).

During complainant's case in chief, complainant's Williams defined the phrase

"digital detector" in purely functional terms. Specifically, he testified:

- Q Now switch to the next program here. The patent refers to a digital detector, the claim refers to a digital detector for receiving said transmission and detecting said predetermined signal in said transmission based on either a specific location or specific time. What is meant by digital detector there in the context of the patent?
- A I believe this is just a device that detects, receives digital information out of the many different signals.
- Q And does the patent describe the operation of such device?

A It shows a digital detector. It does not go into detail of how it may work because there are many different ways that they describe for placing these digital signals.

(Williams, Tr at 444) (emphasis added).

The testimony of the experts that "digital detector" is not a structural phase is further supported by the testimony of the named inventors of the '277 patent, each of whom testified that they had no particular structure in mind for a "digital detector." Thus, the inventors testified that they intended to claim any device capable of performing the function required of the claimed "digital detectors. Specifically, as referenced in FF 40-50, inventor Cuddihy testified at the hearing as follows:

Q As I understand it, one of your primary contributions to the 1981 patent application was the drawings that eventually led to the figures that we see in the '490 patent. Is that correct?

A Yes.

Q And those drawings are essentially functional block diagrams of the systems described in the patent?

A That's correct.

Q Have you -- did you at any time make more explicit drawings of the circuitry that would be used to implement any of those particular functional blocks?

A No.

Q During the course of preparing the 1981 application did you have in mind any particular circuitry that would be used to implement the functional blocks set forth in the diagrams that you drew?

A No.

Q And specifically for example with respect to the box that appears in several of the drawings marked "digital detector" did you have in mind

any particular circuitry which would be used to implement the functionality represented by that box in the 1981 patent application?

A No.

Q Did you have any conversations with Mr. Harvey during that time period as to what circuitry might be utilized to implement that functionality?

A No.

Q In the course of your work as an electrical engineer, had you ever designed a digital detector similar to those set forth in the figures of the '490 patent?

A No.

(Cuddihy, Tr at 774-75) (emphasis added).

Similarly, inventor Harvey testified at his deposition concerning the use of the phrase "digital detector" in the '277 patent as follows:

Q. In drafting any of the patent applications that led to your '277 patent did you have any structure in mind for implementing digital detector 34?

A. I don't believe so.

Q. In drafting any of the patent applications that led to issuance of your '277 patent did you have any structure in mind that would be appropriate for implementation of digital detector 38?

A. I don't believe that we were -- we limited ourselves to any specific structure.

(Harvey, CX 363 at 838) (emphasis added). Inventor Harvey also testified:

Q. In using the term digital detector in your 1987 patent application did you intend in any way to limit the structure that would be used for performing the digital detection function?

A. I don't believe I intended to limit it, no.

(Harvey, CX 363 at 840-41) (emphasis added). Thereafter, inventor Harvey testified:

- Q. And was one of the reasons that you didn't describe a structure beyond just referring to it as a digital detector your desire not to limit the term to any particular structure or structures?

MR. SCOTT: Objection but respond.

THE WITNESS: I think I just said that our objective was not to limit it to any particular structure so if I understand your question you're simply asking me if I meant what I said and the answer is yes.

BY MR. TOUTON:

- Q. Well, I was asking a little bit more than that. First let me clarify what your objective was. Was it your objective to not limit the digital detector to any particular structure or structures?

MR. SCOTT: Asked and answered but answer it again.

THE WITNESS: Our objective was to describe a device which had a particular capacity -- capability, that is to say a device that was capable of detecting digital information and passing it on to equipment which would process the digital information.

BY MR. TOUTON:

- Q. Was it your intention to include within that description any structure of circuitry that would be capable of having that -- excuse me, was it your intention in using the term digital detector to cover any device that had that capability?

MR. SCOTT: Objection, vague. Respond, Mr. Harvey.

THE WITNESS: I believe our objective was to be clear and to be simple and to describe a device which described the functionality of the device. I don't think that we were trying to do -- I don't think we were trying to limit ourselves to a particular form of digital detector. In fact, I know that we were simply trying to say that it is a device capable of serving as a digital detector.

(Harvey, CX 363 at 848-50) (emphasis added).³⁹

Based on the administrative law judge's review of the language of claim 6, other claims in the '277 patent, the specification of the '277 patent, the testimony of both complainant's and respondents' experts, and the testimony of the inventors of the '277 patent,⁴⁰ the administrative law judge finds that the phrase "digital detector" is a functional phrase, not limited to any particular structure. Thus, he interprets the claim 6 element of a "digital detector," as a "means-plus-function" element.

As explained in detail under "indefiniteness" *infra*, the administrative law judge does not find any structural recitation in the specification, as required under 35 U.S.C. § 112, sixth paragraph, and is therefore unable to define that claim phrase in relation to the "equivalent" of any structure disclosed in the '277 specification. Thus, he must construe "digital detector" as used in claim 6 as any means "for receiving said transmission and detecting said predetermined signal in said transmission based on either a specific location or a specific time."

6. "Based On Either A Specific Location Or A Specific Time"⁴¹

Complainant argued that "varying location" should be interpreted as "varying

³⁹ The inventors before filing the '510 application on Nov. 3, 1981 (FF 21) which is the first of the chain of applications that led to the issuance of the '277 patent (FF 22) did not build any prototypes nor did they conduct any physical experiments (FF 65).

⁴⁰ The administrative law judge did not find anything in the prosecution of the '277 patent relevant to the meaning of the phrase "digital detector."

⁴¹ This phrase occurs in the "digital detector" paragraph of claim 6. In the later "controller" paragraph of claim 6, the phrase "based on either a specific location or time" occurs. The parties have made no distinction between said two phrases and the administrative law judge finds none.

frequency.” (CBr at 27-32).⁴² Complainant also argued that “location” as used in claim 6 “includes frequency, such as a carrier frequency or channel.” (CRBr at 8).

Respondents argued that “claim 6 uses ‘location’ in a figurative or metaphorical sense to refer to some characteristic of the signal other than its physical place,” and that “the ‘specific location’ of a signal within a television transmission should be interpreted to refer to the predetermined signal either (a) being embedded alternatively in either the video or the audio portion of the television transmission, (b) when in the video portion, being embedded at a scan line corresponding to a horizontal line on the screen, or (c) when in the audio portion, being embedded at a place in the audio range. In other words, ‘location’ figuratively refers to a place in terms of the perception space of the video and audio presented to the viewer.” (BRBr at 20-21).

The staff argued that “varying locations could mean either varying frequencies or varying positions within the video television signal. More generally, location or time appears to connote a physical or temporal characteristic that allows the particular signal to be found.” (SBr at 25). The staff also argued that “a predetermined signal can have a ‘location’ that is actually a frequency, especially in the case of signals embedded in the audio portion of the television signal at a frequency above the normal human hearing range” and that “a change in carrier frequency does not change the location of the SPAM signals; rather, there

⁴² The meaning of “specific time” is not in issue because complainant has not asserted that respondents infringe claim 6 based on any detection of a predetermined signal at a specific time among the varying timing patterns (Williams, Tr at 548-549, CRBr at 7-9, BRBr at 9-11, SRBr at 25).

can still be an 'unchanging' location for the SPAM signals even if the carrier frequency changes." (SRBr at 6 - 8).

In issue is the meaning of the claim term "location." Claim 6 requires, *inter alia*, predetermined signal "transmitted in a varying location or a varying timing pattern," a digit detector for "detecting said predetermined signal in said transmission based on either a specific location or a specific time;" and a controller "for causing said detector to detect said predetermined signal based on either a specific location or time, said controller being programmed with either the varying locations or the varying timing pattern of said signal," (emphasis added). The word "location" is not expressly defined in claim 6. However, the ordinary meaning of claim 6 would require that the "predetermined signal" is "in" a "varying location" within a "television program transmission." Thus, the administrative law judge finds the ordinary meaning of the word "location" in claim 6 would refer to some part or portion of a "television program transmission."⁴³

The term "location" is used in a number of claims in the '277 patent in addition to claim 6. For example, claim 16 reads:

16. A system for locating an embedded instruct-to-decrypt signal out of a plurality of signals embedded in the video of an analog television transmission and enabling a decryptor to decrypt a portion of the television transmission, said system comprising:

a line receiver for receiving a video signal of an analog television transmission and selecting portions of one or more lines of said video

⁴³ The dictionary definition of location is "2 a: a position or site occupied or available for occupancy (as by a building) or marked by some distinguishing feature <a sheltered ~ > <much of the charm of the house was in its ~ > <discovered the ~ of the hiding place>." Webster's, at 1328.

that contain embedded signals, said line receiver capable of changing the specific portions of said video lines that are selected;

a digital detector operatively connected to said line receiver for receiving said selected portions of video lines that contain the embedded signals, detecting the instruct-to-decrypt signal in said selected portions;

a decryptor operatively connected to said for receiving information on the instruct-to-decrypt signal from said detector and decrypting a portion of said transmission in response to receiving said information; and

a controller operatively connected to said line receiver for causing said line receiver to change the specific portions of video selected by said line receiver on the basis of a varying location or timing pattern of the signals in the transmission, said controller having access to information on the varying location or timing pattern of the signals in the transmission.

(CX 2 at col. 315, lns. 20-48) (emphasis added). Hence, claim 16 refers to a line receiver “selecting portions of one or more lines of said video that contain embedded signals” and thereafter refers to “specific portions of video” being selected “on the basis of a varying location . . . of the signals in the transmission. . .” It also defines “portions of one or more lines” of a video transmission as the “location” of an embedded signal, which “location” may vary. Accordingly, the administrative law judge finds, based on the language of claim 6 and the language of claim 16, that the phrase “varying location” in claim 6 would include varying “portions of one or more lines” of a video transmission in a “television program transmission.”

Referring to the specification of the ‘277 patent, it contains the following description of signals that “may appear in various and varying location:”

In programming transmissions, given signals may run and repeat, for periods of time, continuously or at regular intervals. Or they may run only

occasionally or only once. They may appear in various and varying locations. In television they may appear on one line in the video portion of the transmission such as line 20 of the vertical interval, or on a portion of one line, or on more than one line, and they will probably lie outside the range of the television picture displayed on a normally tuned television set. In television and radio they may appear in a portion of the audio range that is not normally rendered in a form audible to the human ear. In television audio, they are likely to lie between eight and fifteen kilohertz. In broadcast print and data communications transmissions, the signals may accompany conventional print or data programming in the conventional transmission stream but will include instructions that receiver station apparatus are preprogrammed to process that instruct receiver apparatus to separate the signals from the conventional programming and process them differently. In all cases, signals may convey information in discrete words, transmitted at separate times or in separate locations, that receiver apparatus must assemble in order to receive one complete instruction.

(CX 2, col. 9, ln. 61 - col. 10, ln. 16) (emphasis added). In addition, the specification contains the following description of the "location" of SPAM signals embedded in a television program transmission:

SPAM signals can be embedded in many different locations in electronic transmissions. In television, SPAM signals can be embedded in the video portion or in the audio portion of the transmission. In the video portion, SPAM signals can be embedded in each frame on one line such as line 20 of the vertical interval, or on a portion of one line, or on more than one line, and they will probably lie outside the range of the television picture displayed on a normally tuned television set. SPAM signals can be embedded in radio audio transmissions. In the audio of television and radio transmissions, SPAM signals will probably be embedded in a portion of the audio range that is not normally rendered in a form audible to the human ear. In television audio, they are likely to lie between eight and fifteen kilohertz. In broadcast print and data communications transmissions, SPAM signals can accompany conventional print or data programming in the conventional transmission stream.

(CX 2, col. 48, ln. 52 - col. 49, ln. 2)(emphasis added). That portion of the specification teaches that a signal "in the video portion" is in a "location" and a signal "in the audio portion" is in a differing location, with "one line" or "a portion of one line" or "more than

one line" being examples of a signal's "location" within the video portion, and "eight and fifteen kilohertz" being an example of a "location" within the audio portion of a television transmission. The '277 specification also teaches that a "normal transmission location" of a signal in television program transmission:

In television, the normal transmission location of the preferred embodiment is in the vertical interval of each frame of the television video transmission. Said location begins at the first detectable part of line 20 of the vertical interval and continues to the last detectable part of the last line of the vertical interval that is not visible on a normally tuned television set.

(CX 2 at col. 49, lns. 3-9)(emphasis added). Thus, the specification teaches that "one line such as line 20 of the vertical interval, or on a portion of one line, or on more than one line" is a potential "location" of a SPAM signal in a television program transmission (emphasis added). In addition, the '277 specification uses the term "location" to refer to at least an audio frequency range within a television program transmission. Specifically, the specification teaches that "[i]n the audio of television and radio transmissions, SPAM signals will probably be embedded in a portion of the audio range that is not normally rendered in a form audible to the human ear. In television audio, they are likely to lie between eight and fifteen kilohertz." As "kilohertz" is a measurement of frequency, see e.g. McGraw Hill Dictionary of Scientific and Technical Terms at 880, the administrative law judge finds that this is a teaching in the specification that a SPAM signal's location can include its frequency within the audio range of a television transmission.⁴⁴ Accordingly, the administrative law

⁴⁴ The '277 patent contains the following regarding detecting information in a radio transmission:

Said radio-detection-complete information causes controller, 20, to cause oscillator, 6, to cause the selection of the next frequency in the predetermined radio frequency
(continued...)

judge finds, based on the '277 specification, and the language of other claim of the '277 specification that "location" as the word is used in claim 6 would include a line, or lines, or portions of a line in the vertical interval of a television video transmission, or a frequency within the audio range of a television transmission.

The administrative law judge finds that the prosecution history of the '277 patent does not contain any discussion of the phrase "based on a specific location. . ." Moreover he finds extrinsic evidence unnecessary to understand the meaning of the phrase "based on a specific location. . ."

Complainant argued that "location" can also include the carrier frequency of a predetermined signal (CRBr at 8), and that a signal transmitted in a varying carrier frequency is transmitted in a "varying location" in a television program transmission. (CRBr at 27-32). Complainant also argued that "the word 'transmission' as used in [claim 6] therefore include a portion of what was transmitted, even if that portion has been demodulated down to some type of baseband signal." (CRBr at 7). The administrative law judge finds that those arguments are not supported by the '277 patent specification.

⁴⁴(...continued)

selection pattern: 99.0 MHz. Automatically oscillator, 6, causes mixer, 2, to select said frequency and input it, at a fixed frequency, to decoder, 40. Controller, 20, then transmits a particular preprogrammed radio-99.0 instruction to control processor, 44J that informs said processor, 44J, 99.0 MHz is inputted to decoder, 40.

Receiving said radio-99.0 instruction causes control processor, 44J, to cause all apparatus to decoder, 40, to commence receiving, detecting, and processing SPAM message information embedded in the inputted frequency of interest.

However, claim 6 is directed to identifying a predetermined signal in a television program transmission. Accordingly, the administrative law judge finds that the system of claim 6 would not read on a system for identifying a predetermined signal in a radio transmission.

As found supra, the specification does contain a teaching that frequency can be a "location" of a predetermined signal. However, the specification also teaches that this usage of "frequency" is distinct from the "carrier frequency" or "channel" of a given program.⁴⁵

The plain language of claim 6 requires a "predetermined signal in a television program transmission" with said "predetermined signal" being transmitted in a varying location within that transmission, and being detected based on its specific location within that

⁴⁵ Complainant's expert Williams testified that none of the digital detectors disclosed in the '277 specification Figure 2A have a multichannel television transmission input. Thus, no "digital detector" shown in the '277 patent would detect a "predetermined signal" based on its "carrier frequency" because no "digital detector" show in the '277 specification receives more than one "carrier frequency" or more than one "television channel." Specifically, Williams testified:

- Q The inputs to those three digital detectors are all -- well, none of them are multichannel television transmissions; correct?
- A Well, of course, in path C there may be multiple carriers, but it's still a single channel television broadcast.
- Q When you say "multiple carriers," do you mean a carrier and possible subcarriers?
- A Well, at that point, you've taken off the main carrier, so there may be multiple subcarriers as you see in the figure there.
- Q But it's a single television channel?
- A Yes.
- Q And by "single television channel," we generally mean a single carrier band?
- A Well, in this example, of course, the carrier has been taken off by the time we get there.
- Q It's really a baseband video signal?
- A Baseband video plus whatever other carriers there were along with that, like the audio and whatever else, subcarriers if you prefer that term.

(Williams, Tr at 3059-60) (emphasis added).

transmission. Thus, the administrative law judge finds that claim 6 is directed to a single "television program transmission" not multiple transmissions. Moreover, this plain language of claim 6 is supported by the language of the specification, which teaches that "SPAM signals can be embedded in many different locations in electronic transmissions." (CX 2, col. 48, lns. 52-53).

Complainant relies on one example set forth in the '277 patent that teaches embedding a "predetermined signal" (in this example a "SPAM message") containing a recipe and instructions related to "Exotic Meals of India" programing in a "particular second transmission that is different from the transmission of said 'Exotic Meals of India' programming . . . ",⁴⁶ as evidence that a signal's "location" includes its carrier frequency. That "Exotic Meals of India" example deals with SPAM signals embedded on one carrier frequency that are related to a television program transmitted on another carrier frequency. The specification first states, in the "Exotic Meals of India" programming example, that:

One benefit of this method of transmitting the information of said generate-recipe-and-shopping-list instructions is that by causing said instructions to be embedded in the transmission of said "Exotic Meals of India" programming this method enables any subscriber who records the transmission of said programming at a recorder/player, 217, to access the embedded information of said instructions automatically in this fashion whenever the recorded transmission of said programming is played back-and in so doing, to cause the signal processor, 200, of his station to process meter-monitor information of said embedded first and second messages anew whenever TV567# is entered at a local input, 225, in the course of the play back of said transmission. However, this method has the drawback of making the information of said instructions relatively vulnerable to programming pirates (who may be able to manipulate and extract said information relatively easily without causing meter information to be transmitted to remote metering

⁴⁶ CX 2, col. 265, lns. 62-64.

stations) because the embedded location of said instructions is relatively easy to find.

(CX 2, col. 265, lns. 38-58) (emphasis added). The example later states:

This method has the advantage of making the information of said instructions relatively invulnerable to programming pirates because the location of said instructions [more precisely, the particular transmission in which said instructions are embedded] is harder to identify without causing meter information [if only of said first message] to be transmitted to remote metering stations.

(CX 2 at col. 266, lns. 24-31) (emphasis added). The administrative law judge finds that this part of the specification explicitly acknowledges that a change in the carrier frequency that a signal is embedded in, rather than a change in "location," is "more precisely" a change in "the particular transmission" that the SPAM signal is embedded in. Hence, detecting a predetermined signal based on a specific transmission, i.e. carrier frequency, is found by the administrative law judge to be not consistent with the language of claim 6 which requires the digital detector to detect "said predetermined signal in said transmission based on either a specific location or a specific time" (emphasis added). In contrast, complainant's would rewrite the claim beyond the claim's expert language to require a detector that identifies a predetermined signal in one of many television program transmissions, based on either a specific location or a specific transmission.

The distinction between "location" and "channel" or "carrier frequency" is further illustrated in other portions of the '277 specification's discussion of the "normal transmission location" of a SPAM signal. Thus, the specification describes an "unchanging location" for the transmission of SPAM command information as follows:

In the preferred embodiment, while receiver station decoder apparatus may be controlled, in fashions described below, to detect information segment information outside the normal transmission locations, SPAM commands and cadence information are always transmitted in normal transmission locations. In the present invention, the object of many decoders is to detect only command information such as meter-monitor segment information. Having one unchanging location for the transmission of command information in any given television, radio, broadcast print, or data transmission permits decoder apparatus to search just one unchanging portion of said transmission to detect commands. Having the same fixed location for cadence information enables said decoder apparatus to distinguish all command information in said transmission.

(CX 2, col. 49, lns. 31-46) (emphasis added). The administrative law judge finds that this portion of the specification refers to a "preferred embodiment" having "one unchanging location for the transmission of command information in any given television . . . transmission." He further finds that the '277 specification teaches that this allows the decoder to search one location within each transmission. The administrative law judge also finds that this shows the distinction between a change in transmission and a change in location within a transmission. Similarly, the specification teaches an example wherein:

the subscriber station of FIG. 1 is in New York City and is tuned to the conventional broadcast television transmission frequency of channel 13 at 8:30 PM on a Friday evening when the broadcast station of said frequency, WNET commences transmitting a television program about stock market investing, "Wall Street Week."

* * *

. . . . Decoder, 203, is preprogrammed to detect digital information on a particular line or lines (such as line 20) of the vertical interval of its video transmission input; to correct errors in said information; to convert said corrected information into digital signals usable by microcomputer, 205; and to input said signals to microcomputer, 205, at its asynchronous communications adapter.

* * *

At said program originating studio, at the outset of said program transmission, a first series of control instructions is generated, embedded sequentially on said line or lines of the vertical interval, and transmitted on the first and each successive frame of said television program transmission, signal unit by signal unit and word by word, until said series has been transmitted in full.

(CX 2, col. 13, ln. 38 - col. 14, ln. 31) (emphasis added). In the foregoing example, the specification describes a single “conventional broadcast television transmission frequency of channel 13” transmitting a single television program as “said television program transmission” and illustrates “Decoder, 203, is preprogrammed to detect digital information on a particular line or lines (such as line 20) of the vertical interval of its video transmission input” and thus teaches the detection of a signal based on a “location” i.e. “a particular line or lines (such as line 20) of the vertical interval of its video transmission input” of a single television program transmission.

Based on the foregoing, the administrative law judge rejects complainant’s argument that a change in carrier frequency is a change in the “location” of the “predetermined signal” as inconsistent with the plain language of claim 6, as well as the ‘277 specification.

7. “Controller Operatively Connected To Said Detector For Causing Said Detector To Detect Said Predetermined Signal Based On Either A Specific Location Or Time, Said Controller Being Programmed With Either The Varying Locations Or The Varying Timing Pattern Of Said Signal”

Respondents argued that the “controller” of claim 6 “should be interpreted to refer to any device that is capable of exerting control over other components;” and that “[a]lthough the claim requires that the controller be ‘programmed’ . . . programmability is not inherent in the term ‘controller’ itself.” (BRBr at 23). Respondents further argued that the “controller must interact with the digital detector in a manner that makes the detector detect based on either a specific location or time.” (BRBr at 23). Respondents also argued that

“programmed” requires storage of some instruction or command information specifying operations to be performed by the controller; that these operations must cause the detector to detect the predetermined signals at locations or times that are variable (rather than fixed); and that the instruction or command information that constitutes the programming must specify the location or times at which the signals are to be detected. (BRBr at 23).

Complainant argued that the ‘277 patent “discloses a programmable controller, 20, that governs the operation of the signal processing elements of the system. (CBr at 27). Complainant also argued that the “controller” limitation of claim 6 requires “a controller operatively connected to the detector and capable of *causing* the detector to detect the predetermined signal in the transmission at the appropriate time or location.” (CBr at 26) (emphasis in original). Complainant further argued that respondents’ interpretation of “programmed” “is nearly correct,” but claim 6 requires that the controller be programmed with the varying locations or times of said signal. Thus, it is one signal for which the controller is programmed with location or timing information. Two separate signals existing at fixed locations would not meet this element of claim 6 even if the controller were programmed with a location for both.” (CRBr at 8-9). The staff argued that the controller of claim 6 must cause the ‘digital detector,’ not a local oscillator or a tuner or some other component, to detect the predetermined signal.” (SRBr at 5).

The specific language of claim 6 requires a “controller” that is “programmed with either the varying locations or the varying timing pattern of said signal.” (emphasis added) Accordingly, the administrative law judge finds that the “controller” must be a

programmable device, capable of being programmed with either "varying locations or the varying timing pattern" of the "predetermined signal."

In addition, the "controller" of claim 6 must be "operatively connected" to a "digital detector" and must be "for causing said detector to detect said predetermined signal based on either a specific location or time." Thus, the controller must have the capacity to control a "digital detector" such that the digital detector detects a "predetermined signal" "based on either a specific location or time."

The specification contains references to a "controller" in relation to a "digital detector." Thus, Figure 2A of the '277 patent discloses a "controller" 39 that is connected to "digital detector" 34, 37, and 38. The '277 specification reads as follows:

a digital detector, 34, which acts to detect the digital signal information embedded in said information, using standard detection techniques well known in the art, and inputs detected signal information to controller, 39, which is considered in greater detail below. . . . The digital detector, 37, detects signal information embedded in said audio information and inputs detected signal information to controller, 39. . . . a digital detector, 38, which detects signal information embedded in any other information portion of said television channel signal and inputs detected signal information to controller, 39. Line receiver, 33; high pass filter, 36; detectors, 34, 37, and 38; and controller, 39, all operate under control of controller, 39, and in preprogrammed fashions that may be changed by controller, 39.

* * *

a standard digital detector, 43. . . detects the binary signal information in said decoded information and inputs said signal information to controller, 44, discussed more fully below. Circuitry, 41; decoder, 42; and detector, 43, all operate under control of controller, 44, and in predetermined fashions that may be changed by controller, 44.

* * *

an appropriate digital detector, 46. . . detects the binary signal information in said information and inputs said signal information to controller, 47,

considered more fully below. Circuitry, 45, and detector, 46, operate under control of controller, 47, and in predetermined fashions that may be changed by controller, 47.

(CX 2, col. 21, ln. 46 - col. 22, ln. 35). (emphasis added) Thereafter, the specification contains the following description of "controller" 39, 44, and 47:

Each decoder is controlled by a controller, 39, 44, or 47, that has buffer, microprocessor, ROM, and RAM capacities. Said buffer capacity of controller, 39, 44, or 47, includes capacity for receiving, organizing, and storing simultaneous inputs from multiple sources while inputting information received and stored earlier, to said microprocessor capacity of controller, 39, 44, or 47. Said microprocessor capacity of controller, 39, 44, or 47, is of a conventional type, well known in the art, and is specifically designed to have particular register memories, discussed more fully below, including register capacity for detecting particular end of file signals in inputted information. The ROM capacity of controller, 39, 44, or 47, contains microprocessor control instructions of a type well known in the art and includes EPROM capacity. Said ROM and/or said EPROM may also contain one or more digital codes capable of identifying its controller, 39, 44, or 47, uniquely and/or identifying particular subscriber station functions of said controller, 39, 44, or 47. The RAM capacity of controller, 39, 44, or 47, constitutes workspace that the microprocessor of said controller, 39, 44, or 47, can use for intermediate stages of information processing and may also contain microprocessor control instructions. Capacity exists at said controller, 39, 44, or 47, for erasing said EPROM, and said RAM and said EPROM are reprogrammable. Controller, 39, 44, or 47, is preprogrammed to receive units of signal information, to assemble said units into signal words that subscriber station apparatus can receive and process, and to transfer said words to said apparatus. In each decoder, the controller, 39, 44, or 47, receives detected digital information from the relevant detector or detectors, 34, 37, 38, 43, and 46. Upon receiving any given instance of signal information, controller, 39, 44, or 47, is preprogrammed to process said information automatically. Controller, 39, is preprogrammed to discard received duplicate, incomplete, or irrelevant information; to correct errors in retained received information by means of forward error correction techniques well known in the art; to convert, as may be required, the corrected information, by means of input protocol techniques well known in the art, into digital information that subscriber station apparatus can receive and process; to modify selectively particular corrected and converted information in a predetermined fashion or fashions; to identify in a predetermined fashion or fashions subscriber station apparatus to which said signal information should be transferred; and to transfer said signals to said

apparatus. Said controller, 39, 44, or 47, has one or more output ports for communicating signal information to said apparatus.

Controller, 39, 44, or 47, has capacity for identifying more than one apparatus to which any given signal should be transferred and for transferring said signal to all said apparatus. It has capacity for recording particular signal information in particular register memory and for transferring a given signal to one apparatus, modifying it and transferring it to a second apparatus, and modifying it again and transferring it to a third apparatus.

As described above, said controller, 39, 44, or 47, controls particular apparatus of its signal decoder and has means for communicating control information to said apparatus. Said controller, 39, 44, or 47, also has means for communicating control information with a controller, 20, of a signal processor, 26. (Said communicating means is shown clearly in FIG. 2D which is discussed below.) Via said communicating means and under control of instructions and signals discussed more fully below, said controller, 20, has capacity to cause information at said EPROM to be erased and to reprogram said microprocessor control instructions at said RAM and said EPROM.

(CX 2 at col. 22, ln. 36 - col. 23, ln. 42)⁴⁷ (emphasis added). Thus, the '277 specification teaches that a "controller" has "buffer, microprocessor, ROM, and RAM capacities."

Based on the specific language of claim 6, and the '277 specification, the administrative law judge finds that a "controller" within the meaning of claim 6 requires a programmable device, that has "buffer, microprocessor, ROM, and RAM capacities" (CX 2 at col. 22, lns. 37-38) such that it is capable of being programmed with either "varying locations or the varying timing pattern" of a "predetermined signal," and is also capable of causing a "digital detector" to "to detect said predetermined signal based on either a specific location or time."

⁴⁷ The citation to "controller 39" and the description thereof is not found in the '490 specification. Thus, it is new matter that was added to the '277 patent specification on September 11, 1987, which is the date of the continuation in part application Ser. No. 96,096. Because the description of controller 39 is needed to interpret claim 6, the administrative law judge finds that claim 6 is only entitled to a priority date of the continuation in part application Ser. No. 96,096, which is September 11, 1987.

The administrative law judge finds that the foregoing interpretation is confirmed by the testimony of complainant's expert Williams and respondents' expert Schreiber (see e.g. Williams, Tr at 452 - 453; Schreiber, Tr at 1425, 1430, 1794).

B. Claim 7

Claim 7 of the '277 patent in issue reads:

7. A system for locating or identifying a specific signal in a television program transmission that contains digital information and for assembling information contained in said specific signal, said transmission being separately defined from standard analog video and audio television, said system comprising:

a digital detector for receiving at least some information of said transmission and detecting said specific signal at a specific location or time;

a storage device operatively connected to said digital detector for receiving detected digital information of said specific signal and assembling at least some of said digital information into either information or instruction message units; and

a controller operatively connected to said detector and said storage device for causing said detector to locate, detect or output said signal and for controlling a technique used by said storage device to assemble message units, said controller being programmed with information of the composition of said signal or with either the varying location or the varying timing pattern of said signal.

(CX 2 at col. 312 lns. 46-67). In issue for claim interpretation are the phrases (1) "specific signal in a television program transmission," (2) "separately defined from standard analog video and audio television," (3) "a digital detector for . . . detecting said specific signal at a specific location," (4) "a storage device," (5) "assembling . . . into either information or instruction message units," and (6) "a controller . . . programmed with information of the composition of said signal or with either the varying location or the varying timing pattern of said signal."

1. **“Specific Signal In A Television Program Transmission”**

Respondents argued that although the “specific signal” of claim 7 “is a somewhat broader term than predetermined signal” in claim 6, in that specific signal could “in theory” be post- determined, this difference in breath “appears to have no practical significance in the context of claim 7’s other language;” and that the “specific signal” of claim 7, like the “predetermined signal” of claim 6, must be embedded in the television program transmission (BRBr at 24).

The staff argued that there appears to be general agreement that “predetermined signal” in claim 6 and “specific signal” in claim 7 “are intended to refer to the same type of signals;” that both “predetermined signal” and “specific signal” should be interpreted as what the ‘277 patent refers to as “SPAM signals;” and that specific signal is no more limiting than predetermined signal, and is not limited to encompass only “control signals.” (SBr at 28-29).

Complainant argued that it “agrees with respondents and the staff that the specific signal of claim 7 is ‘analogous’ to the predetermined signal of claim 6 for purposes of this case.” (CRBr at 9). Complainant also argued that “the claim 7 system must be preinformed about the signal in order for it to detect ‘a specific signal’” and that “the specific signal is intended for the receiver.” Id.

Based on the arguments of the parties, the language of each of claims 6 and 7 in issue, the language of other claims, and the specification of the ‘277 patent, discussed supra under claim 6, the administrative law judge finds that “specific signal” in claim 7 has the

same scope as “predetermined signal” in claim 6.⁴⁸

2. “Separately Defined From Standard Analog Video And Audio Television”

Each of complainant, and respondents argued that there is not relevant difference between this language in claim 7 and the corresponding language in claim 6, discussed, supra (CRBr at 9, BRBr at 25, SRBr at 14).⁴⁹ The administrative law judge agrees. Accordingly the administrative law judge finds that this phrase should be given the same interpretation in the context of claim 7 as detailed under claim 6, supra.

3. “A Digital Detector For . . . Detecting Said Specific Signal At A Specific Location”

Complainant argued that while the “digital detector” limitation of claim 7 is “similar to that of claim 6, the detector element in claim 7 is more narrow than in claim 6;” that claim 6 requires that the digital detector detect a predetermined signal “based on” either a specific location or time; that claim 6 allows the signal to be detected based on other information as well, as long as it is based at least in part on location or timing; and that claim 7 requires that the “specific signal” be detected “at a specific location or time” and that the controller of claim 7 “need only be capable of causing the detection.” (CRBr at 9-10).

The staff argued that claim 7 requires a “digital detector” that detects a “specific signal” “at a specific location or time;” that this is slightly different from claim 6 where the

⁴⁸ This finding is further supported by the testimony of complainant’s experts Davis and Williams, and respondents’ experts Schreiber, and Ciciora. See e.g. Davis, Tr at 3197, Williams Tr at 561, Schreiber, Tr at 1427, and Ciciora, Tr at 2470.

⁴⁹ The staff argued that “for the purposes of the validity and infringement analysis, the staff claim construction of claim 7 does not differ in any significant respect with the claim construction proposed by respondents.” (SRBr at 14).

digital detector detects a "predetermined signal" based "on either a specific location or a specific time;" that there does not appear to be any meaningful difference between the functional roles of the "digital detector" of the two claims, at least in terms of its ability to detect the desired signal; and that the detection of the specific signal is accomplished by reference to the "specific time or location" of the signal. (SBr at 31-32).

Respondents argued that, similar to claim 6, claim 7 requires that a digital detector detect a specific signal "at a specific location or time;" and that the analysis in the context of claim 6 is "equally applicable to the similar limitation in claim 7." (BRBr at 25).

As discussed under claim 6, supra, the administrative law judge has found that the "digital detector" element in issue is covered by 35 U.S.C. § 112, sixth paragraph. Thus, he interprets the claim 7 "digital detector" element to cover the "corresponding structure, material, or acts described in the specification and equivalents thereof" which accomplishes the function of "receiving at least some information of said transmission and detecting said specific signal at a specific location or time." As the administrative law judge found under indefiniteness, infra, there is no "corresponding structure" disclosed in the '277 specification that would limit the claim element "digital detector" beyond anything that accomplishes the function of "receiving at least some information of said transmission and detecting said specific signal at a specific location or time."

4. "A Storage Device"

Complainant, respondents and the staff agree that claim 7 requires a "memory that can store digital information." (CRBr at 10, BRBr at 25, SRBr at 14). The administrative

law judge agrees. Accordingly, the administrative law judge finds that the claim 7 “storage device” is a “memory that can store digital information.”

5. “Assembling . . . Into Either Information Or Instruction Message Units”

Respondents argued that claim 7 requires a “storage device” that is “for assembling . . . digital information into either information or instruction message units;” that an information or instruction message unit is any complete unit of instruction or information that is sent as a message in the specific signal; that instruction message units are primarily control signals, while information message units are signals that convey information to the receiver, whether or not that information is intended to be displayed to the viewer; and that the term “assembling” should be interpreted according to its ‘ordinary meaning’ to require that parts of the detected information are pieced together into an operative whole (i.e. an instruction or information message unit) (BRBr at 25).

Complainant argued that while the ‘277 patent does not provide a formal definition for “assemble” and that “assemble” means “building a whole message from parts of the message,” contrary to respondents’ position, citing BRBr at 57, 59, 62, 64, 67, 68, claim 7 requires a storage device for performing two functions, viz. “receiving” and “assembling;” and that a device that merely receives data does not meet this claim limitation. (CRBr at 10).⁵⁰

⁵⁰ Respondents apparently agree with complainant’s argument, as respondents did not object to the following proposed finding:

CFF 298. The storage device of claim 7 must be capable of receiving and assembling information. Therefore, assembling must mean something different from receiving. (Davis, Tr at 3204).

(continued...)

The staff argued that the terms “assemble” or “assembling” are meant to include “some sort of processing of disparate precursor data signals into usable units;” and that this does not depart from the general meaning of the term assemble, which is building something larger out of smaller units.” (SBr at 31).

The specific language of claim 7 requires a “storage device” that is for “receiving” at least some of the “detected digital information” of a “specific signal.” The ordinary, dictionary definition of “receive” includes “to take possession or delivery of < – a gift > < suspected of *receiving* the stolen jewels > . . . 2a: to take in: act as a receptacle or container for” (Webster’s Third New International Dictionary at 1894). In addition, the claimed “storage device” is required to “assemble” said “detected digital information.” The ordinary dictionary meaning of the term “assemble” is:

1: to bring or summon together into a group, crowd, company, assembly, or unit <even after a new crew had, at great pains, been assembled - G.V. Heiser> <hold all planes until a striking force could be assembled - H.L. Merillat> 2: to bring together: as a: to put or join together usu. in an orderly way with logical selection or sequence <statistics> <evaluating the data assembled> > <he assembled a large library>

(Webster’s Third New International Dictionary at 131). Thus, in the context of claim 7, based on the ordinary, dictionary definitions of “receive” and “assemble,” the administrative law judge finds that the “storage device” is required to “to take possession or delivery of” or “to take in” the “detected digital information” of a “specific signal,” and that the claimed “storage device” must also “put or join together” in “an orderly way with logical selection

⁵⁰(...continued)
(BRRCF at 167).

or sequence" the "detected digital information" to form either an "information or instruction message unit."

The '277 patent specification does contain a discussion involving "information or instruction message units." Specifically, the '277 patent reads:

In all cases, signals may convey information in discrete words, transmitted at separate times or in separate locations, that receiver apparatus must assemble in order to receive one complete instruction.

(The term "signal unit" hereinafter means one complete signal instruction or information message unit. Examples of signal units are a unique code identifying a programming unit, or a unique purchase order number identifying the proper use of a programming unit, or a general instruction identifying whether a programming unit is to be retransmitted immediately or recorded for delayed transmission. The term "signal word" hereinafter means one full discrete appearance of a signal as embedded at one time in one location on a transmission. Examples of signal words are a string of one or more digital data bits encoded together on a single line of video or sequentially in audio. Such strings may or may not have predetermined data bits to identify the beginnings and ends of words. Signal words may contain parts of signal units, whole signal units, or groups of partial or whole signal units or combinations.)

(CX 2 at col. 10, lns. 13-33) (emphasis added). Accordingly, the '277 specification teaches that "signals may convey information in discrete words, transmitted at separate times or in separate locations," and thus teaches that the disclosed apparatus must "assemble" said information "in order to receive one complete instruction." Thereafter, the '277 specification teaches regarding an "information message units" that a "signal unit" is "one complete signal instruction or information message unit" and that "[s]ignal words may contain parts of signal units, whole signal units, or groups of partial or whole signal units or combinations." The administrative law judge finds that the foregoing teaching in the '277 specification is consistent with the ordinary meaning of language used in claim 7, such that said claim requires the "storage device" to "take possession or delivery of" or "to take in"

the “detected digital information” which may consist of “parts of signal units, whole signal units, or groups of partial or whole signal units or combinations” (emphasis added) (with a “signal unit” being a complete “information or instruction message unit”), and that the claimed “storage device” must also “put or join together” in “an orderly way with logical selection or sequence” the “detected digital information” to form either an “information or instruction message unit.”

Neither claim 7, nor the ‘277 specification explicitly define an “information or instruction message unit.” The ordinary, dictionary definition of “information” is :

d: the communication or reception of knowledge or intelligence <the function of a public library is ~ > . . . 2: something received or obtained through informing: as a: knowledge communicated by others or obtained from investigation, study, or instruction b: knowledge of a particular event or situation: intelligence, news, advices <latest -- from the battle front> <securing -- about conditions in the upper atmosphere> <-- bureau> c: facts or figures ready for communication or use as distinguished from those incorporated in a formally organized branch of knowledge: data <reliable source of -- > d: a signal (as one of the digits in dialing a telephone number) purposely impressed upon the input of a communication system or a calculating machine.

(Webster’s Third New International Dictionary at 1160). Moreover, the ordinary dictionary definition of “instruction” is:

something given by way of direction or order -- usu. used in pl. <gave the maid --s to wait for the grocer> (2): information in the form of an outline of procedures: directions -- usu. used in pl. <the --s for assembling the model>

(Webster’s Third New International Dictionary at 1172). The administrative law judge finds that the specification does teach that “[e]xamples of signal units [i.e. “one complete signal instruction or information message unit”] are a unique code identifying a programming unit, or a unique purchase order number identifying the proper use of a programming unit, or a general instruction identifying whether a programming unit is to be retransmitted immediately

or recorded for delayed transmission." (CX 2 at col. 10, lns. 19-24). The administrative law judge further finds that that portion of the '277 specification is consistent with the ordinary meaning of an "instruction message unit" as "something given by way of direction or order" or "information in the form of an outline of procedures: directions" and thus would refer to information actually used to convey commands or instructions. In contrast, an "information message unit" is a reference to data or information that is not an "instruction."

The administrative law judge also finds that the interpretation of "information or instruction message unit" as referring to information actually used to convey commands or instructions as well as data or information that is not an instruction is consistent with the testimony of respondents' expert Ciciora, who testified that "information" is a reference to "something of useful intelligence to the end viewer," while "instruction" is a reference to "something that controls the way in which something operates." Thus, he testified:

Q . . . What understanding, if any, did you have with respect to the phrase "information or instruction message units"?

A Well, information is interpreted -- I assume or I understand information to mean something of useful intelligence to the end viewer and instruction to mean something that controls the way in which something operates.

(Ciciora, Tr. at 2471, See also Schreiber, Tr. at 1429 - 1430). This construction of "information" is also consistent with the testimony of inventor Cuddihy, who testified that an information message unit is "[s]omething that conveys information to the recipient," which could include textual information (Cuddihy, RX 124 at 710). Cuddihy testified at the hearing as follows:

Q Mr. Cuddihy, I handed you a copy of one of the volumes of your deposition, specifically directed you to page 717. Were you not asked

at that deposition whether a page of teletext information would constitute an information message unit?

A Yes, I was.

Q And your answer at that time was that a page of teletext information could be information message unit, correct?

A Yes, that's correct.

Q Is a sentence of teletext information sent through the vertical blanking interval in a television program information an information message unit?

A I answered previously that it could be.

Q It is your testimony today that it could be?

A Yes.

Q Could a word of teletext information sent through the vertical blanking interval of the television program information be an information message unit?

A We can have one word sentences so a word could be.

(Cuddihy, Tr at 779-780).

6. "A Controller . . . Programmed With Information Of The Composition Of Said Signal Or With Either The Varying Location Or The Varying Timing Pattern Of Said Signal"

Complainant argued that the controller of claim 7 is a "general purpose computer" that "controls the processing needed to build a whole message from parts of the message;" and that the controller of claim 7 is "programmed with information that indicates the composition of the signal or either the timing pattern of the signal or the location of the signal." (CBr at 43). Complainant also argued that there is "little dispute about the controller element of claim 7;" that respondents give "short shrift" to the requirement that

the controller be capable of 'controlling a technique used by said storage device to assemble message units;" that the controller must be capable of manipulating the detected digital information received by the storage device in order to form a complete message for the receiver; and that programming a controller with composition information simply means that the controller will be able to recognize the significance of and the uses from the various fields of data in the signal. (CRBr at 11).

Respondents argued that the differences between the controller of claim 6 and claim 7 are that the claim 7 controller may cause the digital detector to locate or output the signal as an alternative to causing it to detect the signal; that the claim 7 controller must also control the technique used by the claim 7 storage device to assemble the detected information; that an instruction to the "storage device" to store data presented to that memory at specified memory locations qualifies as controlling a technique of assembly; that the claim 7 controller may either be programmed with varying location or timing pattern of the specific signal (like in claim 6) or it may be programmed with information about the composition of the specific signal; and that the language of claim 7 makes clear that a signal's location or time is a different characteristic than its composition. (BRBr at 26).

The staff argued that the "controller" of claim 7 may be programmed with only the composition of the signal, as opposed to its varying time and location; that it is unclear whether the controller must be programmed with the location or time of the signal irrespective of the conditional language of the claim; that the controller causes the "digital detector" to "locate, detect or output said signal;" that it is conceivable that the controller could satisfy the requirement of claim 6 by merely dictating that the digital detector "output"

the signal, thus removing the controller from any role in determining where in the transmission the signal appears; and that, if the controller is to cause the digital detector "to locate" or "detect" the signal, and the digital detector must do so "at a specific location or time," then the controller must have at least information of the "specific location or time" in order to perform this specified function. (SBr at 33).

At closing arguments, the parties argued as follows regarding the "controller" element of claim 7:

Let me ask Mr. Taylor, can I adopt the interpretation that I find for controller of claim 6 and use it in claim 7, and if there's any distinction, it's not anything material, or is there something in there in claim 7 with respect to controller that I've got to look at in particular?

* * *

MR. TAYLOR: I see no difference, your Honor.

JUDGE LUCKERN: Mr. Touton.

MR. TOUTON: I don't see any difference in the word "controller" itself.

JUDGE LUCKERN: I'm talking about the whole phrase.

MR. TOUTON: The whole phrase --

JUDGE LUCKERN: You were talking about the whole phrase, weren't you, Mr. Taylor?

MR. TAYLOR: No. I was referring to the controller.

JUDGE LUCKERN: Is there something there that's specific to the interpretation of that phrase . . . that I should address as far as the interpretation that distinguishes over claim 6?

MR. TAYLOR: There's a difference in the functionality that the controller is carrying out in claim 6 from the functionality that it's carrying out in claim 7. And insofar as the infringement analysis, the claim 6 is addressed to the

control word packets that are associated with a given program, whereas claim 7 is addressed to traditional access packets that are used for software --

* * *

MR. TAYLOR: It's the same element, the same structural element. It has different functionality in the two claims.

JUDGE LUCKERN: Mr. Touton?

MR. TOUTON: I think that's right. In particular, there's the same argument over whether PMC -- as PMC says, it needs to be a general purpose computer, whereas Respondents say you need the device of controls and it's programmable.

JUDGE LUCKERN: Mr. Brittingham?

MR. BRITTINGHAM: Yeah, I think the difference is purely dictated by the differences in the language of the two claims. There's no other thing outside the scope of the particular functionality required that requires a different analysis.

(Tr at 3788-90) (emphasis added).

Based on the arguments of the parties, and the language of claim 7 and the '277 specification, the administrative law judge finds, as with the controller of claim 6 discussed supra, the "controller" of claim 7 is a programmable device that has "buffer, microprocessor, ROM, and RAM capacities." (CX 2 at col. 22, lns. 37-38).

The specific language of claim 7 requires the claimed "controller" be "operatively connected" to both a "digital detector" and a "storage device" and that it be for causing the "digital detector" to "locate, detect or output" a "specific signal." Thus, the ordinary meaning of this claim language, which uses the word "or," is to require the "controller" to cause the "digital detector" to either "locate," or "detect," or "output" a "specific signal."

The specific language of claim 7 further requires that the claimed controller have the capacity to control the "technique used by said storage device to assemble message units." That language is a reference to the "assembly" that must be accomplished by the "storage device" as detailed supra.

Finally, the specific language of claim 7 requires that the controller be "programmed with information of the composition of said signal or with either the varying location or the varying timing pattern" of the "specific signal" (emphasis added). This alternate language would allow the controller to be programmed with either information of the "composition" or the "varying location" or the "varying timing pattern" of the specific signal.

The administrative law judge finds nothing in the record that demonstrates that the inventors intended to depart from the ordinary meaning of the claim language, supra. Accordingly, the administrative law judge finds that the claim 7 "controller" element should be interpreted according to its ordinary meaning.

C. Claim 44

Claim 44 of the '277 patent in issue reads:

A television receiver system comprising:

a television receiver for receiving a selected broadcast or cablecast television transmission and transferring television programming in said transmission to a television display;

an input device for inputting information of the reaction of a viewer to specific television program content;

a digital detector operatively connected to a mass medium receiver for detecting digital information in a mass medium transmission and transferring some of said detected information to a processor; and

a processor operatively connected to said detector and said input device for generating and outputting information of a video overlay that is related to said television programming or said reaction information; and

a television display device operatively connected to said processor for receiving and displaying said video overlay.

(CX 2 at col. 323 lns. 33-53). In issue for claim interpretation are the phrases (1) "a television receiver," (2) "receiving a selected broadcast or cablecast television transmission and transferring television programming . . .," (3) "an input device," (4) "a digital detector," (5) "a mass medium receiver," (6) "a processor," (7) "generating and outputting information of a video overlay," (8) "a television display device," and (9) "a television receiver system."

1. "A Television Receiver"

Respondents argued that claim 44 appears to use a "variant meaning of 'television receiver' in which a standard television set is divided into two parts: a receiver part which generates baseband signals and a display part which receives and displays them." (BRBr at 28).

Complainant argued that it agrees with respondents that the television receiver of claim 44 should be interpreted to refer to the tuner portion of a regular television set. (CRBr at 12).

The staff argued that "there is a question as to whether the television receiver of paragraph one [of claim 44] is the same as the mass medium receiver of paragraph three" and that the use of the differing terms and the separation of the features into different sections of the claim suggest that there are two distinct receivers. (SBr. at 35).

Each of the parties agree that the phrase "television receiver" as used in claim 44 refers to the receiver portion of a television set. The specification of the '277 patent contains the following regarding a commercially available television tuner:

FIG. 1 shows a video/computer combined medium subscriber station. Via conventional antenna, the station receives a conventional television broadcast transmission at television tuner, 215. The Model CV510 Electronic TV Tuner of the Zenith Radio Corporation of Chicago, Ill., which is a component of the Zenith Video Hi-Tech Component TV system, is one such tuner. This tuner outputs conventional audio and composite video transmissions. The audio transmission is inputted to TV monitor, 202M.

(CX 2, col. 12, lns. 52-61). In addition, the '277 specification discloses a system that includes a television receiver that is capable of receiving a "selected television transmission," (i.e., one of many television channels), and transferring television programming in that transmission, such as a particular television show, to a television display. (CX 2, '277 patent at col. 235, ln. 52 - col. 237, ln. 5). See e.g. CFF 380-381, BRRFF at 203.

Accordingly, based on the language of claim 44, and the '277 specification, the administrative law judge construes the phrase "television receiver" as used in claim 44 as directed to a tuner that outputs conventional audio and composite video transmissions, such as the receiver portion of a commercially available television set.

2. "Receiving A Selected Broadcast Or Cablecast Television Transmission And Transferring Television Programming . . ."

Respondents argued that the claim 44 "television receiver" must receive a point-to-multipoint transmission (over-the-air or by cable) which is selected for reception;" and that "television programming" within the meaning of claim 44 is all information transmitted electronically within a television signal. (BRBr at 30).

Complainant argued that a "selected broadcast or cablecast television transmission" is not a requirement of the claim; that only a television receiver that is capable of receiving such a transmission is required. (CRBr at 12). Complainant also argued that "programming" means information that is presented to the viewer or user of the system; and that the television receiver of claim 44 must be capable of transferring television programming (i.e., transmitted video and audio information intended to entertain, instruct or inform the viewer) to a display. (CRBr at 13).

The staff argued that there is a question as to whether "the television transmission of paragraph one [of claim 44] is the same as the mass medium transmission of paragraph three" and that the use of the differing terms and the separation of the features into different sections of the claim suggest that there are two different transmissions. (SBr at 35).

The ordinary, dictionary definition of "television" is:

1: the transmission and reproduction of transient images of fixed or moving objects;
specif : an electronic system of transmitting such images together with sound over a wire or through space by apparatus that converts light and sound into electrical waves and reconverts them into visible light rays and audible sound.

Webster's Third New International Dictionary, at 2351 (1981).⁵¹ The '277 specification uses the phrase "television transmission" as follows:

TV monitor, 202M, has capacity for receiving composite video and audio transmissions and for presenting a conventional television video image and audio sound. One such monitor is the Model CV1950 Color Monitor of the Zenith Radio Corporation.

In the example, the subscriber station of FIG. 1 is in New York City and is tuned to the conventional broadcast television transmission frequency of channel 13 at 8:30 PM on a Friday evening when the broadcast station of said frequency, WNET, commences transmitting a television program about stock market investing, "Wall Street Week."

(CX 2, '277 patent at col. 13, lns. 38-42) (emphasis added). The specification also contains the following regarding "broadcast" and "cablecast" transmissions:

. . . programming may be delivered by any means including over-the-air, hard-wire, and manual means. The stations may transmit programming over-the-air (hereinafter, "broadcast") or over hard-wire (hereinafter, "cablecast"). They may transmit single channels or multiple channels.

(CX 2 at col. 9, lns. 6-11). In addition, each of complainant and respondents cite the portion of the '277 specification which defines programming as:

everything that is transmitted electronically to entertain, instruct or inform, including television, radio, broadcast print, and computer programming as well as combined medium programming.

(CX 2 at col. 8, lns. 20-24). The administrative law judge finds, based on the plain language of claim 44, and the '277 specification, that the "television receiver" of claim 44 must be capable of receiving a "television transmission" that is transmitted either over-the-air (i.e.

⁵¹ The administrative law judge finds this dictionary definition of "Television" consistent with the testimony of respondents' expert Schreiber, who testified that "television" refers to "a picture and sound that we are going to see on the screen. It refers to what we set out to watch rather than to control information or whatever that is used to modify the picture or to operate that, the receiver. . . ." (Schreiber, Tr at 1398).

- c. The Claimed "A Digital Detector For . . . Detecting Said Specific Signal At A Specific Location."

The administrative law judge found under claim construction, supra, that a "digital detector" is anything that accomplishes the function of "receiving at least some information of said transmission and detecting said specific signal at a specific location or time."

The Marti article teaches a "data demodulator" and a "data demultiplexor." The Marti article teaches that the function of the "data demodulator" as follows:

- the data demodulator receives the video signal with the data inserted in.

* * *

The output of this demodulator is a stream of demodulated serial data sliced out from the incoming video signal.

(FF 621) (emphasis added). The Marti article also teaches regarding the "data demultiplexor" that:

- The data demultiplexor receives the data from the demodulator and from the processing unit the following information: the value of the framing word, which indicates also, according to the E B U recommended transmission system, the kind of prefix used; the code of the data channel chosen by the user (3 bytes with the long prefix, 2 bytes for the medium prefix, 1 byte for the shortest one); when the intermediate prefix is used, an indication is necessary to say that it will be a Teletext service and, then the demultiplexor takes account of only 3 bits of the prefix. With the shortest and the longest prefix, the demultiplexor processes a format indication and transmits to the buffer from each data packets either the number of bytes indicated or the maximum format length if the format byte is received with a double error.

All the service bytes being Hamming protected, the demodulator checks whether they are correctly interpretable or not.

(FF 621) (emphasis added). Thus, there is a teaching in the Marti article that the data demodulator "receives the video signal with the data inserted in it" (the "television program

should be interpreted to include viewer reactions to any specific content that appears on the television screen. (SBr at 38).

The specific language of claim 44 requires an "input device for inputting information of the reaction of a viewer to specific television program content." (emphasis added) The parties agree that "The '277 Patent discloses a local input, 225, that allows a user to press buttons on a keypad in order to convey signals to the receiver station" at col. 161, lns. 56-68 (See CFF 388, BRRFF at 205). In issue is whether the "information of the reaction of a viewer" must be limited to that which reacts to "specific content that appears in the video or audio track of a conventional television program" as argued by complainant. The '277 specification states:

As regards broadcast media, systems in the prior art have capacity for receiving and displaying multiple images on television receivers simultaneously. One such system for superimposing printed characters transmitted incrementally during the vertical blanking interval of the television scanning format is described in U.S. patent to Kimura U.S. Pat. No. 3,891,792. U.S. patent to Baer U.S. Pat. No. 4,310,854 describes a second system for continuously displaying readable alphanumeric captions that are transmitted as digital data superimposed on a normal FM sound signal and that relate in program content to the conventional television information upon which they are displayed. These systems permit a viewer to view a primary program and a secondary program.

(CX 2 at col. 4, lns 54-68) (emphasis added). In addition, the '277 specification states:

each subscriber of said combined medium views programming that is personalized and private. The programming he views is his own -- in the example, his own portfolio performance -- and his programming is not viewed by any other subscriber nor is it available at the program originating studio. In addition, personalized programming is displayed only when it is of specific relevance to the conventional television programming of said combined medium.

(CX 2, col. 17, lines 24-32) (emphasis added). Thus, the '277 specification distinguishes

“conventional television programming” from other types of “programming,” such as “personalized programming.”

Based on the plain language of claim 44, and the usage of the terms “program,” “programming,” and “television programming” in the ‘277 specification, the administrative law judge finds that the input device element of claim 44 requires an “input device” that is for inputting information of the reaction of a viewer in response to “specific television program content” in the claimed “television programming.”

4. “A Digital Detector”

Each of complainant, respondents, and the staff argued that the “digital detector” of claim 44 is the same as the “digital detector” required in claim 6. (CRBr at 14, BRBr at 31, SBr at 39).

As discussed under claim 6, supra, the administrative law judge has found that the “digital detector” element of each of claims 6, 7 and 44 in issue is covered by 35 U.S.C. § 112, sixth paragraph. Thus, he must interpret the claim 44 “digital detector” element to cover the “corresponding structure, material, or acts described in the specification and equivalents thereof” which accomplish the function of “detecting digital information in a mass medium transmission and transferring some of said detected information to a processor.” As the administrative law judge found under indefiniteness, infra, there is no “corresponding structure” disclosed in the ‘277 specification that would limit the claim element “digital detector” beyond anything that accomplishes the function of “detecting digital information in a mass medium transmission and transferring some of said detected information to a processor.”

5. "A Mass Medium Receiver"

Respondents argued that a "mass medium receiver" should be interpreted to be a device that receives a modulated electronic mass medium transmission, demodulates it, and outputs the transmission's information content in an unmodulated (baseband) form (BRBr at 32).

Complainant argued that this element of claim 44 requires a receiver capable of receiving a mass medium transmission, such as television, radio, and broadcast print; that two examples in the patent of a mass medium receiver are a cable box and an antenna; and that the "mass medium receiver" of claim 44 must be construed to cover at least these examples. (CBr at 54, CRBr at 14).

The staff argued that "mass medium receiver" is not explicitly defined in the specification of the '277 patent, and that "it would appear to include television receivers as well as some other sort of receiver apparatus." (SBr at 35, fn. 31).

The term "mass-medium receiver" is not explicitly defined in the '277. However, the specification does contain the following regarding "mass media:"

For years, television has been recognized as a most powerful medium for communicating ideas. And television is so-called "user-friendly"; that is, despite technical complexity, television is easy for subscribers to use.

Radio and electronic print services such as stock brokers' so-called "tickers" and "broad tapes" are also powerful, user friendly mass media. (Hereinafter, the electronic print mass medium is called, "broadcast print.")

But television, radio, and broadcast print are only mass media. Program content is the same for every viewer. Occasionally one viewer may see, hear, or read information of specific relevance to him (as happens when a guest on a television talk show turns to the camera and says, "Hi, Mom"), but such electronic media have no capacity for conveying user specific information simultaneously to each user.

(CX 2 at col. 2, ln. 63 - col. 3, ln. 11) (emphasis added). Thus, the specification identifies "television, radio, and broadcast print," with "broadcast print" encompassing "Radio and electronic print services such as stock brokers' so-called 'tickers' and 'broad tapes'." In addition the '277 specification contains a discussion of a variety of "receiver apparatus," including "TV receivers 53, 54, 55, and 56," which are discussed as follows:

FIG. 6 illustrates Signal Processing Apparatus and Methods at an intermediate transmission station that is a cable television system "head end" and that cablecasts several channels of television programming. The means and methods for transmitting conventional programming are well known in the art. The station receives programming from many sources. Transmissions are received from a satellite by satellite antenna, 50, low noise amplifiers, 51 and 52, and TV receivers, 53, 54, 55, and 56. Microwave transmissions are received by microwave antenna, 57, and television video and audio receivers, 58 and 59. Conventional TV broadcast transmissions are received by antenna, 60, and TV demodulator, 61. Other electronic programming transmissions are received by other programming input means, 62. Each receiver/modulator/input apparatus, 53 through 62, transfers its received transmissions into the station by hard-wire to a conventional matrix switch, 75, well known in the art, that outputs to one or more recorder/players, 76 and 78, and/or to apparatus that outputs said transmissions over various channels to the cable system's field distribution system, 93 which apparatus includes cable channel modulators, 83, 87, and 91, and channel combining and multiplexing system, 92.

(CX 2 at col. 181, ln. 67 - col. 182, ln. 22) (emphasis added). Also, the '277 patent teaches:

FIG. 7D, which is described more fully below, shows that a microcomputer, 205, can be controlled by SPAM information embedded in transmissions other than television transmissions. Thus, because the particular decoder that controls a particular associated apparatus will be configured and preprogrammed to detect SPAM information in every transmission that can be inputted to and control said apparatus, the decoder, 203, associated with microcomputer, 205, may be modified to constitute an "All Signal Decoder" through the addition of additional apparatus such as the radio receiver circuitry, 41, radio decoder, 42, and digital detector, 43, of the Radio Signal Decoder of FIG. 2B and the other receiver circuitry, 45, and digital detector, 46, of the Other Signal Decoder of FIG. 2C, said additional apparatus operating under the control of the controller, 39, of said decoder, 203, and inputting detected digital information to the buffer, 39A, of said controller, 39.

If a given intermediate or output apparatus can receive transmissions from more than one source or of more than one kind—television, radio, or other—it will have sufficient apparatus to monitor every channel and kind of transmission it can receive. For example, FIG. 5 shows multi-picture TV monitor, 148, that has capacity to receive two inputted transmissions and has two TV decoders, 149 and 150. In the preferred embodiment, one decoder, 149, is located at a point in the circuitry of monitor, 148, where said decoder, 149, receives the information of one inputted transmission; the other decoder, 150, is located at a point in said circuitry said decoder, 150, receives the information of the other inputted transmission. And for example, FIG. 5 shows radio tuner & amplifier, 213, that also has capacity to receive two inputted transmissions and has two decoders: radio decoder, 138, and other decoder, 281. In the preferred embodiment, one decoder, 138, is located at a point in the circuitry of tuner & amplifier, 213, where said decoder, 138, receives information of one inputted transmission (e.g., the selected radio frequency that is the particular frequency, of the spectrum of wireless frequencies received at antenna, 199, and inputted via switch, 258, that is the frequency that the radio tuner of tuner & amplifier tunes to); the other decoder, 281, is located at a point in said circuitry where said decoder, 281, receives the information of the other inputted transmission (e.g., the output frequency of record turn table, 280, inputted via said switch, 258).

(CX 2, col. 177, ln. 38 - col. 178, ln. 17) (emphasis added). Thus, the '277 specification makes explicit reference to a "TV receiver" to a "radio receiver" and to "other receiver circuitry." Figure 6A of the specification discloses a "satellite earth station receiver" 50, which is identified in the specification as "satellite antenna, 50" (CX 2 at col. 182, ln. 6), and a "microwave receiver system" 57, which is referred to in the specification as "microwave antenna, 57" (CX 2 at col. 182, lns. 8-9), and a "television video and audio receiver" 58 (CX 2 at col. 182, lns. 9-10). Thus, combining the specification's discussion of "mass media" with the use of "receiver" the administrative law judge finds that the claim 44 "mass media receiver" is directed to either a TV, radio, or "other" receiver, such as a "satellite" receiver or a "microwave" receiver, or a "receiver" that is capable of receiving a combination of TV, radio, and "other" transmissions, such as a "satellite" or "microwave" or "broadcast print" transmission.

6. "A Processor."

Complainant argued that claim 44 requires a processor at the receiver station that locally generates and outputs certain video overlays (CBr at 56). Complainant also argued that the processor described in the '277 patent is a microcomputer such as an IBM personal computer; and that the claim term "processor" is intended to have its "normal" meaning of "a type of programmable machine intelligence, not merely some circuit element that performs a step on a signal (CRBr at 15). Respondents argued that term processor refers to any circuit or device that performs steps on input data (BRBr at 33).

The specific language of claim 44 requires a processor that is "operatively connected" to a "digital detector" and an "input device" and is "for generating and outputting information of a video overlay" that is related to either "television programming" or "information of the reaction of a viewer to specific television program content." The ordinary, dictionary definition of "processor" is "1. A device that performs one or many functions, usually a central processing unit. 2. A program that transforms some input into some output, such as an assembler, compiler, or linkage editor." McGraw Hill Dictionary of Scientific and Technical Terms, 4th Ed. at 1498-99. The specification does not expressly define "processor" as being a "microcomputer." Rather, the specification uses the term "microprocessor" and the term "microcomputer" in addition to the term "processor." Specifically, the '277 specification reads:

Microcomputer. 205. is a conventional microcomputer system with disk drives that is adapted to have capacity for receiving signals from decoder, 203; for generating computer graphic information; for receiving a composite video transmission; for combining said graphic information onto the video information of said transmission by graphic overlay techniques, well known in the art; and for outputting the resulting combined information to a TV monitor, 202M, in a composite video transmission.

One such system is the IBM Personal Computer

* * *

At said subscriber station, microprocessor, 205, contains a conventional 5 1/4" floppy disk at a designated one of its disk drives that holds a data file recorded in a fashion well known in the art. Said file contains information on the portfolio of financial instruments owned by the subscriber that identifies the particular stocks in the portfolio, the number of shares of each stock owned at the close of business of each business day from the end of the previous week, and the closing share prices applicable each day. Decoder, 203, is preprogrammed to detect digital information on a particular line or lines (such as line 20) of the vertical interval of its video transmission input; to correct errors in said information; to convert said corrected information into digital signals usable by microcomputer, 205; and to input said signals to microcomputer, 205, at its asynchronous communications adapter.

(CX 2 at col. 13, ln 8 - 62) (emphasis added). However, the specification also describes a "signal processor" see CX 2 at col. 23, ln. 45 et. seq., which is not a "microcomputer."

Accordingly, based on the language of claim 44, and the use of both "processor" and "microcomputer" in the '277 specification, the administrative law judge finds that the "processor" of claim 44 is a device that is capable of taking an input of "digital information" and "reaction information" and using that information to generate and output information of a video overlay that is related to said television programming or said reaction information. The administrative law judge further finds that the "processor" of claim 44 includes, but is not limited to, a "microcomputer."

7. "Generating And Outputting Information Of A Video Overlay"

Respondents argued that the "ordinary" meaning of "generate" is "to cause to be" or "bring into existence," should be adopted; and that, under this definition, a "character generator" which receives coded data and produces video overlay, is sufficient (BRBr at 33). Complainant argued that the specification makes a clear distinction between the

"microcomputer generated graphic" and the "studio generated graphic;" that claim 44 covers a "microcomputer generated graphic;" and that this phrase requires "a processor at the receiver station that locally generates and outputs certain video overlays." (CBr at 56).

Complainant also argued that claim 44 requires the processor be capable of locally creating "information of a graphic (i.e. the overlay), rather than simply producing video signals based on studio-generated overlay information;" and that "a mere character generator receiving studio-generated data would not meet this limitation as alleged by respondents." (CRBr at 15).

The staff argued that the plain meaning of the term "generating" would require only that the processor create the information necessary to display the overlay, that information being the appropriate red/green/blue signals that cause a video display device to display the text or images representing the overlay. (SBr at 39).

The term "generating" is not expressly defined in the '277 specification. However, the specification contains the following examples relating to the "generation" of a "overlay" or "graphic image:"

Microcomputer, 205, is a conventional microcomputer system with disk drives that is adapted to have capacity for receiving signals from decoder, 203; for generating computer graphic information; for receiving a composite video transmission; for combining said graphic information onto the video information of said transmission by graphic overlay techniques, well known in the art; and for outputting the resulting combined information to a TV monitor, 202M, in a composite video transmission.

(CX 2 at col. 13, lines 8-17) (emphasis added). Thus, the '277 specification makes reference to "generating computer graphic information" as a distinct capability from "combining said graphic information onto the video information of said transmission by graphic overlay

techniques." The '277 specification also uses the term "generating" an overlay in relation to the Wall Street Week television program. Specifically, the '277 overlay:

Subsequently, a second series of instructions is embedded and transmitted at said program originating studio. Said second series is detected and converted into usable digital signals by decoder, 203, and inputted to microcomputer, 205, in the same fashion as the first series.

* * *

Under control of said program instruction set and accessing the subscriber's contained portfolio data file for information in a fashion well known in the art, microcomputer, 205, calculates the performance of the subscriber's stock portfolio and constructs a graphic image of that performance at the installed graphics card. The instructions cause the computer, first, to determine the aggregate value of the portfolio at each day's close of business by accumulating, for each day, the sum of the products of the number of shares of each stock held times that stock's closing price. The instructions then cause microcomputer, 205, to calculate the percentage change in the portfolio's aggregate value for each business day of the week in respect to the final business day of the prior week. Then in a fashion well known in the art, the instructions cause microcomputer, 205, to enter digital bit information at the video RAM of the graphics card in a particular pattern that depicts the said percentage change as it would be graphed on a particular graph with a particular origin and set of scaled graph axes. Upon completion of these steps, the instructions cause microcomputer, 205, to commence waiting for a subsequent instruction from decoder, 203.

* * *

While microcomputer, 205, performs these steps, TV monitor, 202M, displays the conventional television image and the sound of the transmitted "Wall Street Week" program. During this time the program may show the so-called "talking head" of the host as he describes the behavior of the stock market over the course of the week. Then the host says, "Now as we turn to the graphs, here is what the Dow Jones Industrials did in the week just past," and a studio generated graphic is transmitted. FIG. 1B shows the image of said graphic as it appears on the video screen of TV monitor, 202M. Then the host says, "And here is what your portfolio did." At this point, an instruction signal is generated at said program originating studio, embedded in the programming transmission, and transmitted. Said signal is identified by decoder, 203; transferred to microcomputer, 205; and executed by microcomputer, 205, at the system level as the statement, "GRAPHICS ON".

Said signal instructs microcomputer, 205, at the PC-MicroKey 1300 to overlay the graphic information in its graphics card onto the received composite video information and transmit the combined information to TV monitor, 202M. TV monitor, 202M, then displays the image shown in FIG. 1C which is the microcomputer generated graphic of the subscriber's own portfolio performance overlaid on the studio generated graphic. And microcomputer, 205, commences waiting for another instruction from decoder, 203.

(CX 2, col. 15, ln. 28 - col. 16, ln. 48) (emphasis added). Thereafter, the '277 patent reads:

The FIG. 1C combining of the "Wall Street Week" example provides one example of such a combining. The computer system of said example consists of a plurality of microcomputers, 205, each of which is at a different subscriber station, and the program originating studio that originates transmission of the "Wall Street Week" programming embeds and transmits a series of SPAM messages that control all of said microcomputers, 205. Under control of the first message, each one of said plurality of microcomputers, 205, generates its own specific FIG. 1A information. Then, under control of the second message, each of said microcomputers, 205, combines its specific FIG. 1A information with transmitted FIG. 1B information, and all of said microcomputers, 205, display their specific FIG. 1C images (which differ from station to station).

(CX 2 at col. 238, lns. 31-47) (emphasis added). Thus, the specification makes reference to a "microcomputer generated graphic" which is "of the subscriber's own portfolio performance" as well as a "studio generated graphic." The specification uses the term "generate" to describe the process of creating the graphic, rather than to describe the step wherein the "microcomputers, 205, combines" the "microcomputer generated graphic" with a "studio generated graphic."

Another example in the '277 specification involves the display of an overlay of the title of a television program and the actors and crew members, wherein the overlay is "locally generated." Specifically, the '277 patent reads:

Then said studio embeds in the full field video and transmits a SPAM message that contains said execute-at-205 execution segment information and information segment information of a particular titles-of-this-program program instruction set. Receiving said message causes apparatus at each station to execute the information of said set at the microcomputer, 205, of said station. So executing said information causes said microcomputer, 205, to commence generating at said RAM, in a fashion well known in the art, the image information of a so-called "crawl" of said titles. In so doing, said studio causes said microcomputer, 205, to display the information of said titles at the monitor, 202M, of said station. (Simultaneously, a microcomputer, 205, at every other subscriber station executes the same information and displays the same titles, and said studio transmits audio information of appropriate so-called "program theme music," causing apparatus at each station to emit the sound of said music.)

(CX 2, col. 256, ln. 57 - col. 257, ln. 7) (emphasis added). The specification thus uses the word "generate" in relation to a "microcomputer" "generating" the image information of a so-called "text-crawl" of the title of a given television program, and causing said titles to be displayed on a monitor.

Based on the specific language of claim 44, and the foregoing portions of the '277 specification, the administrative law judge finds that the plain meaning of the phrase "generating and outputting information of a video overlay" requires only that the "processor" of claim 44 must create the information necessary to display the overlay on a "television display device."

8. "A Television Display Device"

Complainant argued that the television display element of claim 44 could be a standard television monitor capable of receiving composite television transmissions and displaying "conventional television audio and video." (CBr at 57). Complainant further argued that only a single television display is required by claim 44. (CRBr at 12).⁵²

⁵² Claim 44 has an element of "a television display device" detailed infra.

Complainant also argued that claim 44 only requires a television display device capable of receiving and displaying an overlay. (CRBr at 16).

Respondents argued that the television display device of claim 44 receives and displays the video overlay. (BRBr at 34).

The parties apparently agree that the "television display device" of claim 44 is satisfied by a "conventional commercially available television monitor." Thus, CFF 413 reads in part as follows:

The '277 Patent provides support for this element of claim 44 as a conventional commercially available television monitor

(CFF 413), citing CX 2, at col. 13, lns. 32-37. Respondents object to this proposed finding as follows:

BOCFF 413. Incomplete and misleading citation of the record. When the system of claim 44 relies upon a TV monitor for the television display, there must also be a separate TV receiver. If a system relies only upon the monitor to display images from the mass medium receiver without including in the system a television receiver, then such a system will not be within the scope of claim 44.

(BRRFF at 221). It is undisputed that claim 44 requires one element that is "a television receiver, . . ." and a second element that is a "television display. . . ." Thus, respondents' objection is apparently based on the fact that a system having only a "television display" and no "television receiver" would not fall within the language of claim 44.

Based on the language of claim 44 and the '277 specification, supra, the administrative law judge finds that the claim 44 element of a "television display device" requires a "television monitor."

Also in issue is whether two "television display devices" are required by claim 44. Thus, claim 44 recites "a television display" (col. 323, line 36) and "a television display device" (col. 323, line 50).

An antecedent basis must exist for each element recited in a claim, as ambiguity would result if an element were preceded by the definite article when first mentioned in the claim. Thus, the first time an element or part is mentioned in a claim, the indefinite article "a" or "an" should be used, and subsequent mention of the element is modified by the definite article "the" or "said," thus making later mention(s) of the element unequivocally referable to its earlier recitation. See e.g. Certain Anti-Theft Deactivatable Resonant Tags and Components Thereof, Inv. No. 337-TA-347, Unreviewed Initial Determination (December 9, 1993), citing 2 Peter D. Rosenberg, Patent Law Fundamentals, § 14.06 (2d ed. rev. 1993), J. Landis, Mechanics of Patent Drafting, 29 (2d ed. 1974), 2 I. Kayton & K. Kayton, Patent Practice, at 10-18 (5th ed.), Slimfold Mfg., Co. v. Kinkead Properties, Inc., 626 F.Supp. 493, 495, 229 U.S.P.Q. 298, 299 (N.D. Ga. 1985). The administrative law judge finds that the use of "a" to introduce the element "television display" creates some ambiguity as to whether this is the same "television display" referenced in the first paragraph of claim 44 under "television receiver . . ." However, based on a reading of the claim as a whole, in light of the '277 specification, the administrative law judge finds that the claim 44 language in issue can be understood to refer to only a single "television display." Thus, the plain language of claim 44 defines the purpose of the "television receiver" element as "receiving a selected broadcast or cablecast television transmission and transferring television programming in said transmission to a television display." (emphasis added). Accordingly,

the administrative law judge finds that the claimed "television receiver" is provided to transfer "television programming" that is received in a "selected broadcast or cablecast television transmission" to a "television display." Claim 44 also requires an input device that is "for inputting information of the reaction of a viewer to specific television program content." (emphasis added). Hence, a viewer must be able to react to "specific television program content" of the "television programming" that is displayed on "a television display." Claim 44 further requires a "video overlay that is related to said television programming or said reaction information." The purpose of the "television display device" is to "receiv[e] and display[] said video overlay." The plain meaning of "video overlay," supported by examples in the '277 specification, implies that "television programming" will be displayed on the same "television display" as the "video overlay" such that the "video overlay" may be superimposed on top of, or combined with said programming.

The '277 specification provides examples, quoted supra, relating to the "generation" of a "overlay" or "graphic image" that is related to specific television programming. According, the '277 specification states, in the "Wall Street Week" example that "TV monitor, 202M, displays the conventional television image and the sound of the transmitted "Wall Street Week" program. . . . and a studio generated graphic is transmitted. FIG. 1B shows the image of said graphic as it appears on the video screen of TV monitor, 202M. . . . TV monitor, 202M, then displays the image shown in FIG. 1C which is the microcomputer generated graphic of the subscriber's own portfolio performance overlaid on the studio generated graphic." (CX 2, col. 15, ln. 28 - col. 16, ln. 48) (emphasis added). Accordingly, the administrative law judge finds, based on the specific language of claim 44,

and in light of the '277 specification, that claim 44 requires only a single "television display device."

9. "A Television Receiver System"

Complainant argued that claim 44 should be interpreted such that "a 'selected broadcast or cablecast television transmission' is not a requirement of" claim 44; that "[a]s for the 'mass medium transmission,' no such transmission is actually required by claim 44;" and that the "television display device" is not required to "actually receive and display an overlay." (CRBr at 12 - 16) (emphasis added).

The administrative law judge finds, based on the specific language of claim 44, as supported by the examples related to "video overlays" quoted supra, that the "television receiver system" of claim 44 must be for (1) receiving a "television transmission" and transferring "television programming" from said transmission to a "television display," (2) accepting, through an "input device" "information of the reaction of a viewer" to "specific television program content" that is in the "television programming" transmitted to the "television display," (3) receiving a "mass medium transmission," and detecting digital information, some of which is transferred to "a processor," (4) generating and outputting information of a video overlay that is related either to "television programming" transmitted in said "television transmission" or to "the reaction of a viewer" to "specific television program content" in the "television programming," and (5) displaying the "video overlay" in combination with the "television programming" on a "television display." The specific language of claim 44 thus describes the object or reason for each structural component, and thereby defines the relationship between different claim elements.

Claim 44 does not use the phrase “capable of but not required to” or any similar phrase, as argued by complainant. Thus, complainant would rewrite claim 44 to require a “television receiver” that may or may not receive “a selected broadcast or cablecast television transmission” and may or may not transfer “television programming in said transmission to a television display;” a “digital detector” that may or may not detect “digital information in a mass medium transmission” and may or may not transfer “some of said detected information to a processor;” and a “television display device” that may or may not receive and display a “video overlay.” This proposed rewriting is inconsistent with the plain language of claim 44.

Based on his consideration of the language of claim 44, and the specification of the ‘277 patent, the administrative law judge interprets claim 44 such that a “selected broadcast or cablecast television transmission” is actually required. He interprets claim 44 such that a “mass medium transmission,” is required. He interprets claim 44 such that a “processor” is required to either generate an overlay on top of and related to “television programming” that is transmitted in a “selected broadcast or cablecast television transmission” or the “processor” is required to generate an overlay that is related to the “reaction of a viewer” to “specific television program content” of “television programming” that is transmitted in a “selected broadcast or cablecast television transmission.” He further finds that claim 44 requires a “television display device” that actually receives and displays an overlay on top of “television programming.”

The administrative law judge finds that the foregoing interpretation of claim 44 is supported by testimony of complainant’s expert Davis. Thus, Davis testified that claim 44

requires a video overlay that is overlaid on television programming coming in through the broadcast or cablecast transmission, because "it doesn't make any sense to have an overlay if you can't overlay it on the programming." Specifically, Davis testified:

QDoes the selected broadcast or cablecast television transmission get detected by the digital detector?

A I don't think so.

Q Where does it go?

A It goes to the receiver system up there on the second line of the claim.

Q And it's displayed on the television display?

A That's what the claim says on line 37. It says --really, the whole first bullet, "a television receiver for receiving a selected broadcast or cablecast television transmission and transferring television programming in said transmission to a television display."

Q So, then, in the last element we have a television display device for displaying the video overlay; correct?

A That's correct.

Q Is that the same television display device or a different one?

A It's the same one. I don't know that there's a distinction, but I assumed it was the same one as up in the top part of the claim.

Q Let me ask you this. What's a video overlay?

A That was a driving force behind why I thought it was the same device. It doesn't make any sense to have an overlay if you can't overlay it on the programming. Since the programming in the first bullet is going to the television display, line 37, I think that's where the video overlay has got to end up, too.

Q Can you have a video overlay that completely covers the television programming? Is that still an overlay?

A I think so.

Q So at least under your understanding of claim 44, the video overlay is going to be displayed in the display device, and it will be overlaid on the television programming coming into the broadcast or cablecast television transmission?

A Correct.

(Davis, Tr 3437-8).

Moreover the administrative law judge finds that the following testimony of complainant's expert Williams where he testified that no "television transmission" and hence no "television programming" is required, is inconsistent with both the plain language of claim 44, and the testimony, supra, of complainant's Davis:

Q The first element of claim 44 requires that the receiver be capable of receiving a selected broadcast or cablecast television transmission and transferring television programming in that transmission to a television display; correct?

A Yes.

Q And it's that television programming which comes through the broadcast or cablecast transmission which must have an overlay put on top of it as a result of the operation of the digital detector and the processor and what's received in the mass-medium transmission. Isn't that how you understand this claim?

A That is not how I understand this claim.

Q How do you understand the relationship between the broadcast and cablecast transmission and the television programming?

A This broadcast or cablecast television transmission tells us what this television receiver must be able to receive. We're modifying this television receiver, but that doesn't mean that we necessarily have to have a broadcast or cablecast transmission, but this television receiver would have to be for receiving a broadcast or cablecast television transmission.

Q If there's no broadcast or cablecast transmission, then what does the overlay go on top of?

- A Well, the overlay goes on top of the image that's presented out from the television display device in the last element of the claim.
- Q And if there's no broadcast or cablecast transmission, then, the only thing the image could be overlaid on top of is what's coming through the mass-medium receiver; correct?
- A The information that's coming over the mass-medium receiver, that would be correct, I believe.
- Q Well, if that's the case, what's the purpose of having a television receiver in the system?
- A Well, it's there for receiving this if this is here. It could be that the information coming out of the processor would be encoded in a form of the sort that one would expect to see if one were receiving directly broadcast or cablecast television.

(Tr at 855-56). Thereafter Williams testified as follows:

- Q Do you see the section in the first paragraph of claim 44 that refers to television programming?
- A Where it says line 35, "transferring television programming?"
- Q "In said transmission"?
- A Yes.
- Q One of the types of overlays that claim 44 contemplates is an overlay related to "said television programming"; is that correct?
- A Yes.
- Q Is "said television program," as that phrase is set forth in line 49, referring to the television programming in line 35?
- A I believe it would be related to whatever television programming has been received here, which I believe comes in from the -- over the mass-medium receiver.
- Q Isn't the television programming coming in in said transmission in line 35 referring back to a selected broadcast or cablecast television transmission?

A I don't think that's necessarily true. As I said before, I believe before receiving is describing capability of the television receiver. It doesn't mean that it has to be receiving a broadcast or cablecast transmission. It has to be capable of doing that.

Q But isn't the use of the word "said" before usually a term that's referring to a previous usage of that term?

A I believe so.

Q Can you find the words "television programming" prior to line 49 where the term "said television programming" is used?

A I believe the only place is up in the first element there.

Q In the first element --

A I was reading it quickly just to make sure I was saying something was accurate.

Q In the first element television programming is in said transmission, so which transmission are we talking about?

A Well, as I understand this, this receiver is capable of receiving this, but what may be coming out from down here to the television display device, the processor is operatively connected to television display device. That operative connection may be through the television receiver and what may be coming out of this device is something in the form of broadcast or cablecast television transmission. The television receiver is capable of receiving.

Q So in your interpretation the video overlay that is related to said television programming does not have to be related to programming that actually arrives in the broadcast or cablecast television transmission?

A I don't see anything here that requires that.

(Williams, Tr at 883-5).⁵³

⁵³ Thus complainant's own experts proposed two distinct definitions for language of claim 44. As the Federal Circuit has found:

diverse definitions reflect either in-artful drafting, a conscious attempt to create ambiguity

VII Each Of Claims 6, 7 and 44 Is Invalid Under 35 U.S.C. §112, Second Paragraph With Respect To The Claimed Element “Digital Detector”

The administrative law judge in “The Claim Interpretation” Section VI, supra, has found that the digital detector limitation in each of claims 6, 7 and 44 is a mean-plus-function element. Respondents argued that the use of the functional term “digital detector” renders each of claims 6, 7 and 44 indefinite (BRBr at 90). Respondents further argued that complainant in its initial post hearing submission “pays scant attention to the claim-definiteness issues, other than to confuse them with enablement issues” and to mischaracterize In re Dossel 115 F.3d 946, 42 U.S.P.Q.2d 1881 (Fed. Cir. 1997) (Dossel); that when a claim element is stated in 35 U.S.C. §112, sixth paragraph form, the specification of the patent must describe a structure for performing the function specified by the claim element; and that failure to do so means that the inventors have failed to comply with the mandate of 35 U.S.C. § 112, second paragraph which requires that the “specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.” (BRRBr at 27).⁵⁴

The staff argued that since no structure is evident from the specification of the ‘277 patent and because the inventors have explicitly stated that they had no intention of limiting

about the scope of the claims, or a desire to claim a wide variety of [inventions] not described or enabled in the specification.

Genentech Inc. v. The Wellcome Foundation Ltd., 29 F.3d 1555, 1564, 31 U.S.P.Q.2d 1161, 1167 (Fed. Cir. 1994).

⁵⁴ The manufacturing respondents adopted the arguments of the broadcasting respondents. (MRRBr at 1).

their claims to a particular structure, each of the asserted claims is invalid as indefinite under 35 U.S.C. § 112, second paragraph. (SRBr at 22).

Complainant argued that Dosse held that a means-plus-function element with no supporting structure described (or even mentioned) in the specification was not indefinite because those of ordinary skill in the art would have known what device was referred to and would have known how to use it to perform the claimed function; and that in this investigation because those of ordinary skill in the art would have known what was meant by the claimed words “digital detector,” for the reasons set forth in Dosse, the claimed digital detector element is not indefinite “under section 112(6).” (CRBr at 43).

Complainant’s reference to “under section 112(6)” is not understood. As Dosse points out:

Judge Rich, writing for the in banc court in *In re Donaldson Co.*, 16 F.3d 1189, 29 USPQ2d 1845 (Fed. Cir. 1994) [Donaldson], made precisely this point when he said,

[a]lthough paragraph six statutorily provides that one may use means-plus-function language in a claim, one is still subject to the requirement that a claim “particularly point out and distinctly claim” the invention. Therefore, if one employs means-plus-function language in a claim, one must set forth in the specification an adequate disclosure showing what is meant by that language. If an applicant fails to set forth an adequate disclosure, the applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112.

Id. at 1195, 16 F.3d 1189, 29 U.S.P.Q.2d at 1850.⁵⁵

⁵⁵ This portion of Donaldson is found in the following expanded text of Donaldson

Contrary to suggestions by the Commissioner, our holding does not conflict with the principle that claims are to be given their “broadest reasonable interpretation” during prosecution... Generally speaking, these claim interpretation principles remains intact. *Rather, our holding in this case merely sets a limit on how broadly the PTO*

Thus the question in the case before us is not whether there has been compliance with some aspect of § 112 ¶ 1, but whether, in utilizing the authority of § 112 ¶ 6 to claim in means-plus-function form, the drafter has adequately described structure, material, or acts which satisfy the claiming requirement of § 112 ¶ 2. [emphasis added]

Dossel, 115 F.3d at 946, 42 U.S.P.Q.2d at 1884, 1885.⁵⁶ Hence the issue here is whether

may construe means-plus-function language under the rubric of "reasonable interpretation." Per our holding, the "broadest reasonable interpretation" that an examiner may give means-plus-function language is that statutorily mandated in paragraph six. Accordingly, the PTO may not disregard the structure disclosed in the specification corresponding to such language when rendering a patentability determination.

Our holding similarly does not conflict with the second paragraph of section 112. Indeed, we agree with the general principle espoused in *In re Lundberg*, 244 F.2d at 547-48, 113, U.S.P.Q. at 534 (CCPA 1979), that the sixth paragraph of section 112 does not exempt an applicant from the requirements of the first two paragraphs of that section. Although paragraph six statutorily provides that one may use means-plus-function language in a claim, one is still subject to the requirement that a claim "particularly point out and distinctly claim" the invention. Therefore, if one employs means-plus-function language in a claim, one must set forth in the specification an adequate disclosure showing what is meant by that language. If an applicant fails to set forth an adequate disclosure, the applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112.

Also contrary to suggestions by the Commissioner, our holding does not conflict with the general claim construction principle that limitations found only in the specification of a patent or patent application should not be imported or read into a claim.... *The Commissioner confuses impermissibly imputing limitations from the specification into a claim with properly referring to the specification to determine the meaning of a particular word or phrase recited in a claim.... What we are dealing with in this case is the construction of a limitation already in the claim in the form of a means-plus-function clause and a statutory mandate on how that clause must be construed.*

16 F.3d at 1195, 29 U.S.P.Q.2d at 1850 (emphasis added and certain citations and footnotes omitted). Donaldson in said text fully supported its holding by harmonizing it with prior rules of claim interpretation and other parts of 35 U.S.C. § 112.

⁵⁶ The unanimous court in Donaldson held that "paragraph six [of section 112] applies regardless of the context in which the interpretation of means-plus-function language arises, i.e., whether as part of a patentability determination in the PTO or as part of a validity or infringement determination in a court." 16 F.3d at 1193, 29 U.S.P.Q.2d at 1848.

the inventors on the '277 patent have adequately described the claimed "digital detector" element in terms of "structure, material, or acts" in the '277 specification which satisfies the claiming requirement of 35 U.S.C. § 112, second paragraph. Complainant is correct that Dosse found that the claiming requirement of 35 U.S.C. § 112, second paragraph, viz. that the invention be particularly pointed out and distinctly claimed, was satisfied. However, that finding was "because of the specific facts" in Dosse, 115 F.3d at 947, 42 U.S.P.Q.2d at 1885. The administrative law judge finds that the specific facts in this investigation are distinguishable from those in Dosse. Specifically, he finds that the '277 specification does not disclose any structure that would correspond to the function of the "digital detector" element of claims 6, 7, and 44 in issue, and does not have an adequate disclosure "showing what is meant by that [digital detector] language." Rather, the '277 specification discloses a functional block labeled "digital detector." He finds that complainant was unable to point to any structure in the specification that would allow the administrative law judge to limit the claim phrase "digital detector" to a specific structure and the equivalents thereof. The administrative law judge also finds that the '277 specification fails to disclose to one of ordinary skill in the art any structure that corresponds to the "digital detector" as claimed in each of claims 6, 7 and 44.

Complainant argued that "a tuner, a demodulator and a bit comparator - 'tailored to the particular input characteristics'. . . are the usual components that act as a digital detector" while admitting that "[p]erhaps not all of these components would be required in every situation." (CRBr at 50).

The administrative law judge finds that Figure 2A, and the associated specification portion (CX 2, '277 patent at col. 21, ln. 16 to col. 22, ln. 35), discloses a "demodulator" and a "digital detector" as distinct components. Figure 1 discloses a "tuner" as a component distinct from a "digital detector" (CX 2 at col. 14, lns. 43-51). In addition, the specification states that "[n]ot every installed decoder in said signal processor system requires all the apparatus and system capacity of FIGS. 2A, 2B, and 2C. For example, because a television base band signal is inputted to decoder, 203 of FIG. 1, said decoder does not require filter, 31, and demodulator, 32, of FIG. 2A." (CX 2 at col. 24, lns. 3-8) (emphasis added). Thus, he finds that the specification does not support complainant's argument that a "digital detector" includes a "demodulator" and a "tuner" as the specification discloses that a "demodulator" a "tuner" and a "digital detector" are distinct components of the "signal decoder apparatus." Moreover, certain "decoder" apparatus will require both a "demodulator" and a "digital detector," while other decoders that receive a "television base band signal" do not require a "demodulator" but still require a "digital detector." In addition, this disclosure of a digital detector and a demodulator as distinct apparatus is persuasive evidence that a "digital detector," is not meant to include a "demodulator" as a structural component. Also, complainant admits that "[p]erhaps not all of these components would be required in every situation," (CRBr at 50), thus conceding that the phrase "digital detector" does not imply any one definitive structural composition.

The administrative law judge further finds complainant's argument that "a tuner, a demodulator and a bit comparator- 'tailored to the particular input characteristics' ... are the usual components that act as a digital detector" inconsistent with the testimony of

complainant's expert Williams, who explicitly testified that a "digital detector" could imply many structural elements, so long as the combination of elements accomplished the function of detecting and outputting a digital signal from a larger transmission. Thus during complainant's case in chief, complainant's expert Williams testified that the specification "shows a digital detector" but that the specification "does not go into detail of how it may work." Specifically, he testified:

Q Now switch to the next program here. The patent refers to a digital detector, the claim refers to a digital detector for receiving said transmission and detecting said predetermined signal in said transmission based on either a specific location or specific time. What is meant by digital detector there in the context of the patent?

A I believe this is just a device that detects, receives digital information out of the many different signals.

Q And does the patent describe the operation of such device?

A It shows a digital detector. It does not go into detail of how it may work because there are many different ways that they describe for placing these digital signals.

(Williams, Tr at 444) (emphasis added). Thereafter, during complainant's rebuttal case, complainant's Williams attempted to identify a structure that "may" be in a "digital detector" disclosed in the '277 specification. However, his testimony did not establish that the specification disclosed any structure that would accomplish the function of the claimed "digital detector" as used in claim 6, 7 and 44. Rather, without reference to the '277 patent, Williams was only able to speculate as to certain components that could achieve the function of the "digital detector" disclosed in the '277 patent. Thus, Williams testified regarding

"digital detector 37" of Figure 2A:

Q What would you expect to be included in digital detector 37 by way of structure, assuming the signal is as you just described it?

A Digital detector 37 may have to select some portion of the spectrum that's come out of the high pass filter but it will certainly have to demodulate that portion of the spectrum and pass that demodulated signal on to some sort of digital processing that may clean out the wave form, may do some other processing on the digital wave form before it sends digital information out of block 37.

Q Assuming it had to select some portion of the spectrum, what kind of component or circuit configuration would you expect to be in digital detector 37?

A Possibly some filtering or some sort of tuning function.

(Williams, Tr at 2995) (emphasis added). Accordingly, the administrative law judge finds that Williams confirmed that "digital detector 37" did not disclose any definite structure to one of ordinary skill in the art; that he was only able to testify that "digital detector 37" in the '277 specification "may have to select some portion of the spectrum that's come out of the high pass filter;" that it "will certainly have to demodulate that portion of the spectrum;" that it would have "some sort of digital processing;" and that it "may do some other processing." Moreover, even given an added assumption presented by complainant's counsel that the "digital detector" had "to select some portion of the spectrum," Williams testified that said digital detector would include "[p]ossibly some filtering or some sort of tuning function."

Complainant's expert Williams' testimony regarding "digital detector 38" disclosed in Figure 2A of the '277 patent further demonstrated that the '277 specification failed to

disclose any definite structure for the claimed "digital detector." Specifically, he testified as follows regarding "digital detector block 38" on Path C of Figure 2A:

[Q] Now, with respect to this path that goes through path C, tell us what you would expect to be in the digital detector block 38 in path C, Dr. Williams.

A Everything -- all of the signals, of course, out of block 32 appear to be arriving here, the input to block 38, so there has to be something within that block 38 that is going to select a particular portion of the spectrum, select the signal that's of interest to us, this control signal or whatever, out of this batch of signals, out of this broader spectrum.

Once that has been selected, then it would have to be demodulated to get down to something that could then be processed further into a bit stream, and possibly some digital processing on it.

(Williams, Tr at 2996) (emphasis added). Thereafter, in relation to any "structure" associated with "digital detector" 38 of Figure 2A, complainant's Williams testified that he would "take a look at what functions I need inside of here, inside digital detector 38, what things digital detector 38 needs to do." Specifically, Williams testified:

I've drawn a spectrum over here, but I'm going to change modes a little bit. On the output here -- I'll just write the word, a bit stream of some sort, and that's what I'm trying to get out of here, a bit stream.

BY MR. TAYLOR:

Q "Out of here" being?

A Out of digital detector 38. Let me draw a line here. I'm going to take a look at what functions I need inside of here, inside digital detector 38, what things digital detector 38 needs to do. It needs to select -- let me call it select embedded carrier. I'll say embedded.

* * *

THE WITNESS: What I'm doing here is I have all of the signal that's coming in to this digital detector, and I have to get rid of the stuff I'm not interested in. So I'm tuning or selecting -- I'm getting this piece of

information and eliminating this piece of information, so that's one step I need to do.

BY MR. TAYLOR:

Q And what's the structure? Let's take this in small bites. What's the structure you need in order to select this embedded carrier?

A I need a tuner, a selector of some sort to do that.

Q And what kinds of circuits will perform that function?

A Well, certainly, I could use a mixer followed by a fixed filter. I could use -- if I know precisely where this is going to be, I could perhaps use a fixed filter.

Q "This" being?

A This being this portion of the spectrum, the portion of the spectrum at interest. If I knew it was going to be in a number of fixed places, I could use different filters and choose among the filters. It wouldn't be as good a design, but, in fact, I could have a tunable filter that would choose a particular -- I mean, there are a lot of different ways I could tune to this carrier out of this group.

Q What next do you have to do inside box 38 after you tune to the carrier that you've designated as A?

* * *

Q Just so the record here is completely clear, Dr. Williams, tell us the structure shown on figure 1 that actually accomplishes this tuning function by which the whole spectrum is moved so that a portion of the spectrum lines up exactly with the band pass filter.

A In that example, where we're looking at the carriers, that spectra is coming in, and the local oscillator is presenting a particular frequency to the mixers. And by mixing the local oscillator with the incoming signal, one of the results we get out of this is this spectrum moved.

Q So going back to the internal structure of block 38 on figure 2A, continue with your description of the process by which that filter -- or that signal gets selected.

- A After I've done that whole process and I've demodulated the signal, I still end up with this baseband video, and this audio, and something else which I've drawn here as being another point in the spectrum. I then have to go about selecting this, selecting this particular block and that's what this box here would do, and it could do it in exactly the same way. That would be one option.
- Q Exactly the same as what?
- A Exactly the same way we described here for selecting a particular channel out of many channels.
- Q And your reference to here is figure 1?
- A Figure 1 and the mixer is the local oscillator. That would be one way you could do it.
- Q What else would you expect to find inside box 38?
- A Well, I still have my information sitting on a carrier here. I have to demodulate that.
- Q Refresh us on what carrier and information -- what those two words mean in this context.
- A I'm drawing a box here I'm labeling demodulator. I have a bit stream or whatever. My information has been used to change some of the characteristics of a higher frequency carrier. This moves my information out from the baseband to some higher frequency, so it's sitting up here around this carrier. The information is around this carrier. What I want is to get rid of the carrier and get back to this information, bit stream or whatever, and what I have here is the demodulator, this box here, following this thing that I used for selecting the embedded carrier.
- Q Why don't you put a B on demodulator.
- A Okay.
- Q The witness has put a B on the demodulator on CPX 85. And the demodulator, in a sentence or two, what does it do?
- A It's going to get rid of the carrier and get our information -- get the modulation back down to baseband.

Q What else would you expect to be in box 38?

A I'll come down here to another box I'll label C, and I'll call this, for want of something better, some sort of digital processing and I'll explain what that is.

Q In a sentence or two, tell us what digital processing refers to.

A Well, if this demodulator – conceivably coming out of the demodulator, I could have something that has already been converted to ones and zeros. Ultimately it could still be an analog signal and need some further processing, shaping of pulses and that type of thing, to get it into a bit stream. I also might look for patterns in that bit stream, do error correction – there are a lot of different things I could possibly do. But what's going to come out of here, then, is some sort of processed bit stream.

Q Just so the record is clear, the bottom portion of this box you've drawn has boxes A, B and C. Select embedded carrier is A; demodulator is B; and digital processor is C. Now, draw a box in red around that that would represent the portion that is box 38 on figure 2A?

A I was describing with this what needed to be in box 38, so all of those elements would be in box 38 in this particular example, embodiment.

(Williams, Tr at 2998-3005) (emphasis added). Thus, while complainant's Williams was able to identify certain components that "might" be inside "digital detector 38," he was only able to do so with regards to the function that digital detector was asked to perform in Figure 2A. Significantly, Williams did not make reference to what the specification disclosed as being part of "digital detector 38," but merely the components that Williams might choose in a given situation to accomplish the function of the disclosed "digital detector." Moreover, Williams later admitted that there is no single structure that could replace each "digital detector" disclosed in the specification. Hence, Williams testified:

Q Now, the television program transmission of claim 6 is being received by the digital detector; correct?

A Yes.

Q Can you think of a single device or single category of devices, other than a box named digital detector, that is capable of accepting an input of a multichannel cable transmission, a single carrier — a single band television carrier transmissions, a baseband video signal?

A Well, depending upon what form you have it in, you would have to do some processing on it to get it to some other form. So there a single box that does everything? No.

Q Wouldn't those devices required to take that input be wildly different devices?

A I wouldn't say they'd be wildly different. There'd be different processing that would have to be done. I may have to extract one or more signals from carriers. If I look at this, I have coming on the left of this, many carriers. I'm referring to figure 2A. Many carriers coming in here and the filter brings it down to one, and then the amplitude demodulator brings it down to baseband, but wildly different. I mean, each of those pieces in there would be a pretty straightforward thing to put in place or not have in place. It's straightforward to design.

Q Digital detector 37 on figure 2A of the '277 patent is taking in a relatively narrow band of audio frequencies; right? Correct?

A Yes. We know we have zero to 15 kilohertz coming into the high pass filter, so there's a narrower band than that coming out, I would expect.

Q And the output of that is some digital signal?

A That's correct.

Q And that's a digital detector, as the patent discloses?

A That's what they call it here.

Q Now, figure 1 [of the '490 patent⁵⁷] has a multichannel cable transmission as an input; correct?

⁵⁷ While Williams was referring to Figure 1 of the '490 patent, a comparison of Figure 1 of the '490 patent with Figure 2 of the '277 patent shows that they are similar.

A That's correct.

Q And the output, among other things, is digital signals?

A Yes, that's correct.

Q So the digital detector that receives a television program transmission and detects digital information could be this little box 37 [titled "digital detector"], or it could be figure 1 [identified as "a signal processor" [CX 2, the '277 patent at col. 11, ln. 45 and in CX 3, the '490 patent at Fig. 1], which, of course, incorporates figure 2A in box 30?

A Well, it's being more specific here. It's providing additional standard types of devices to do processing on the signal that's coming in, converting the signal, changing it in some way. But yes, I have television programming. I have signals coming in, and I have digital information coming out.

Q So this whole combination of figures 1 and 2A is a digital detector, as that term is used in claim 6, according to your definition?

A He specifically calls figure 1 a signal processor and I think the reason for that is because of the addition of this other processing around it, but it is taking in an analog signal that's made up of many carriers with much information and it is putting out digital information.

(Williams, Tr at 3096 - 3098) (emphasis added). Complainant's Williams further testified:

Q - Dr. Williams, I put figure 2A up again from the '490 patent. Isn't it also true that there's nowhere in either the '490 or the '277 patent where a digital detector is expressly defined as having a tuner, a demodulator and a comparator?

A I don't think I saw that anywhere in either of the patents. Specifically, I don't.

(Williams, Tr at 554) (emphasis added). The administrative law judge finds that the testimony of complainant's Williams demonstrates that the '277 specification fails to disclose to one of ordinary skill in the art any structure that corresponds to the "digital detector," as claimed in the claims in issue.

Under 35 U.S.C. § 112, second paragraph, the requirements of definiteness in claims are to permit those skilled in the art to understand “what is claimed when the claim is read in light of the specification” and “to permit a potential competitor to determine whether or not he is infringing.” Morton International, Inc. v. Cardinal Chemical Co., 5 F.2d 1464, 1470, 28 U.S.P.Q.2d 1190, 1194, 1195 (Fed Cir. 1993), on remand from, 113 S.Ct. 1967, 26 U.S.P.Q.2d 1721 (1993). In this context the claims are addressed to the questions of 1) what is patented and 2) has what is patented been infringed. The administrative law judge finds that Williams’ testimony establishes that one skilled in the art would not understand what is claimed in claims 6, 7 and 44 in issue, when those claims are read in light of the specification, and that a potential competitor would not be able to determine whether or not he is infringing each of claims 6, 7 and 44.⁵⁸

The testimony of the testifying experts is further supported by the testimony of the named inventors of the ‘277 patent, quoted supra under claim construction, each of whom testified that they had no particular structure in mind for a “digital detector.” For example,

⁵⁸ Complainant itself has wavered with respect to claim interpretation. Thus in an “infringement claim chart” attached as Exhibit A to complainant’s 1/13/97 answer to the broadcasting respondents’ first set of interrogatories, signed by inventor Harvey, complainant stated that the “DSS receiver transport IC” found in the accused DSS receivers was the “digital detector for receiving said transmission and detecting said predetermined signal in said transmission based on either a specific location or a specific time” required by claim 6, (RX 136, Exhibit A at 2). However, complainant’s expert Williams testified at trial, and complainant argued in its posthearing brief, that the “digital detector” element of claims 6, 7, and 44 is met by{

} (CBr at 34-35, 46, 59). While complainant on 1/13/97 may not have had confidential information relating to respondents’ accused “DSS receiver transport IC”, the fact that complainant on 1/13/97 interpreted the “digital detector” element of claim 6 as directed to only the “DDS receiver transport IC” and later interpreted the “digital detector” element of claim 6 as directed to a{
} is further evidence that a potential competitor would not be able to determine if its product infringed the “digital detector” element of claims 6, 7, and 44. Hence, this is additional support that the claimed “digital detector” element is indefinite.

inventor Harvey testified in relation to the "digital detector" that "Our objective was to describe a device which had a particular capacity -- capability, that is to say a device that was capable of detecting digital information and passing it on to equipment which would process the digital information." (Emphasis added) See "Claim interpretation" Section VI A5, *supra*.

Based on the foregoing, the administrative law judge finds that respondents have met their burden in showing that each of claims 6, 7 and 44 is not valid under 35 U.S.C. § 112, second paragraph because the inventors of the '277 patent have not satisfied the claiming requirement of 35 U.S.C. § 112, second paragraph, which the administrative law judge finds distinct from the enablement requirement of 35 U.S.C. § 112, first paragraph,⁵⁹ with respect to the claimed element "digital detector" in each of claims 6, 7 and 44.

VIII Each Of Claims 6, 7 And 44 Is Invalid Under 35 U.S.C. § 112, First Paragraph For Failure Of The '277 Specification To Enable The Practice Of Said Claims

The broadcasting respondents argued that the '277 specification fails to enable the practice of claims 6, 7 and 44 in issue, as required by 35 U.S.C. § 112, first paragraph.

(BRBr at 88).⁶⁰

Complainant argued that respondents have failed to point out precisely why the claims in issue are not enabled; and that the evidence at the hearing demonstrated that those of ordinary skill in the art in 1981 clearly could have made and used the claimed inventions in issue. (CRBr at 42).

⁵⁹ See 3 Donald S. Chisum, Chisum on Chisum Patents § 8.03, (1997).

⁶⁰ The manufacturing respondents adopted the broadcasting respondents arguments (MRRBr at 1).

The staff argued that while the specification of the '277 patent may provide "less than optimum guidance," respondents have not succeeded in showing by clear and convincing evidence that the specification does not enable a person of ordinary skill in the art to make and use the devices of claims 6, 7 and 44. (SBr at 88).

The first paragraph of 35 U.S.C. § 112 reads in pertinent part:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and . . .
[emphasis added].

Hence, it is the specification of a patent that must contain an adequate written description to satisfy the enablement requirement. The issue is whether the '277 patent specification adequately teaches one of ordinary skill in the art how to make and use the invention claimed in each of claims 6, 7 and 44 in issue.

Patent protection is granted in return for an enabling disclosure of an invention, not for vague intimations of general ideas that may or may not be workable. While every aspect of a generic claim need not have been carried out by an inventor, or exemplified in the specification, reasonable detail must be provided in order to enable members of the public to understand and carry out the invention. See Genentech, Inc. v. Novo Nordisk A/S, 108 F.3d 1361, 1366, 42 U.S.P.Q.2d 100 (Fed. Cir. 1997).

In addition, while the description requirement found in 35 U.S.C. § 112, first paragraph is separate from the enablement requirement found in said first paragraph, the purpose of the written description requirement is to state what is needed to fulfil the enablement requirement. Hence, while the description and enablement requirements of 35

U.S.C. § 112, first paragraph may be viewed separately, they are intertwined. In other words, the written description of the specification must communicate that which is needed to enable the skilled artisan to make and use the claimed invention. See Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1563-64, 19 U.S.P.Q.2d 1111, 1117 (Fed. Cir. 1991) See also Martin v. Mayer, 823 F.2d 500, 504 (Fed. Cir. 1987), Eiselstein v. Frank, 52 F.3d 1035, 1038 (Fed. Cir. 1995). It "is not sufficient for purposes of the written description requirement of § 112 that the disclosure, when combined with the knowledge in the art, would lead one to speculate as to modifications that the inventor might have envisioned, but failed to disclose." Lockwood v. American Airlines, 107 F.3d 1565, 1572 41 U.S.P.Q.2d 1961, 1966 (Fed. Cir. 1997).

During opening arguments, complainant's counsel argued that it will show with the proper interpretation of the claims in issue by this administrative law judge "to find legal principles examining specific claim language, meaning the specifications about the '277, and since it's a continuation in part, specifications of the '490." (Tr at 124-125). Moreover, complainant argued that both the '490 and '277 patent specifications are enabling with respect to claims 6, 7, and 44 in issue, and that complainant is entitled to a November 3, 1981 filing date. See e.g. CRBr. at 22, 42.

The '490 patent issued on September 15, 1987 from an approximately 44 page specification that was filed on November 3, 1981. The application resulting in the '490 patent, inter alia, led to the issuance of the '277 patent (FF 21, 89). However, claims 6, 7 and 44 of the '277 patent are in issue, and not any claim of the '490 patent. The claims in issue were not added to the prosecution leading to the '277 patent until July 14, 1993, long

after the '490 patent had issued and after the filing of a continuation in part application on September 11, 1987, which contained a 557 page specification (FF 21, 89), and which application also led to the issuance of the '277 patent. Hence, while the 44 page specification of the '490 patent is certainly easier to deal with than the 557 page specification from which the '277 patent issued, the administrative law judge finds that one of ordinary skill in the art would look to the '277 patent specification, and not the specification of the '490 patent, to determine whether the specification contains a written description of the claimed inventions sufficient to enable any person skilled in the art to make and use the inventions because the claims in issue are from the '277 patent, and not from the '490 patent.

Complainant's expert Davis testified as follows regarding the relation of the '277 specification to the '490 specification:

Q In trying to understand the claims 6, 7 and 44 that are at issue in this case in -- the '277 patent is quite a large document as everyone has mentioned here, was there some way you approached the specifications of the '277?

A I tried not to. If I had been given a choice, I would have stuck with the '490. It's so much shorter.

* * *

THE WITNESS: Sir, to go back and answer his question, in all honesty, the '490 patent is 24 columns long, inclusive of everything. When I received the '277 patent, my heart truly sank because I knew I would have to read and absorb the patent. But having done that and then going back to study the patent in more detail, what I think is important to say is that you can gain a complete understanding of what's going on in the patent in total by reading and focusing on the first 25 to 30 columns of the '277, your Honor. You don't need to read all 310 or 20 or 30 or whatever it is, columns of this patent before you can understand what's being said here. The first 25 or 30 columns gives 95, 98 percent of the idea that's being presented.

(Davis, Tr. at 3110-3111). The "first 25 to 30 columns" of the '277 specification, which Davis testified contained "98 percent of the idea that's being presented" in the '277 patent are not the same as the "24 columns" of the '490 specification. Also, complainant did not rely on only the "first 25 to 30 columns" of the '277 patent in construing the language of claims 6, 7, and 44 in issue, nor did complainant rely on only the "first 25 to 30 columns" of the '277 patent as an enabling disclosure supporting the inventions of claims 6, 7 and 44 in issue. Moreover, the administrative law judge finds it virtually impossible to compare the '490 specification with the '277 specification because, as admitted by complainant's counsel at closing arguments, the disclosure in the 24 columns of the '490 patent, if indeed it is all carried forward, is interspersed among some 328 columns of the '277 patent.

At closing argument complainant's counsel argued that "[t]o the extent that the '490 has relevance, it is because it is part of the file history of the '277" (Tr. at 3658); that complainant "cited to the '490 because it's significantly shorter and we hoped to shorten some of your Honor's work" (Tr. at 3656); and that:

To the extent -- and I'm unaware of any significant differences between the '490 and the '277. I haven't seen one, and I don't remember it. Certainly, I made an effort early on to determine whether or not the disclosures of the '490 made their way into the '277, and although they're spread around and sometimes stated a little bit differently, for all the relevant purposes of this hearing, the '490 is expanded by the '277. It's certainly not inconsistent.

(Tr. at 3658-3659). Contrary to the argument of complainant, there is at least one significant difference in the specifications of the '490 and '277 patents, viz. the fact that the '277 specification is more than ten times the length of the '490 specification. Moreover, assuming no inconsistencies between the two specifications, it is indisputable that the '277 specification contains a significant amount of material that was added to the disclosure of the '490

specification in 1987 (i.e. over 500 pages of text). The difficulty in determining what substantive disclosure, if any, was added is compounded by the fact that the disclosures of the '490 patent, as admitted by complainant's counsel, are "spread around and sometimes stated a little bit differently" in the '277 specification. This difficulty is highlighted with respect to complainant's claim interpretation arguments. Thus, in responding to complainant's argument that the "predetermined signal" of claim 6, and the "control signal" of claim 7 must be limited to a "control signal," (see supra under claim construction), the staff argued as follows regarding the teachings of the '490 and '277 specifications:

Even more difficult to understand is PMC's assertion that the French chef example [in the '490], and I'm quoting from their brief, "it says nothing about the recipe being sent in any type of SPAM signal." And that's at footnote 2, page 3 of PMC's reply brief.

Technically, they're correct, because the term "SPAM signal" was introduced in the '277 patent or the specification that led to the '277 patent, and it doesn't appear in the '490 patent. However, PMC cannot deny that the following language appears in the '490 patent: "An alternate method for transmitting the recipe to printer 221 would be for the recipe itself to be located in a coded digital form in the programming transmission received by TV set 202. In this case, decoder 203 would identify the signals conveying the recipe and transfer them via processor 204 to signal processor 200, which would decrypt them itself and transfer them via those means, in which case it would have to go to printer 221." That's at column 20, lines 60 through 68. And signal processor 200 is figure 1 that [complainant's counsel] Mr. Taylor referred to in his opening remarks.

(Tr. at 3620)(emphasis added). Accordingly, the phrase "SPAM signal" which is found critical to complainant's argument that a "predetermined signal" in claim 6 and a "specific signal" in claim 7 must be a "control signal" is not found in the '490 specification.

Moreover, complainant has relied on other material that is contained in the '277 specification, but not contained in the '490 specification to give meaning to certain claim

terms. For example, as noted supra, under claim construction, the mention of "digital video" and "digital audio" in the specification of the '277 patent was used by both complainant and the administrative law judge to define the claim 6 and claim 7 phrases "in a television program transmission" and "separately defined from standard analog video and audio television." However, not only is there no discussion of "digital video" and "digital audio" in the '490 specification, respondents' expert Schreiber testified that the '277 specification's description of "digital video" and "digital audio" was not enabling.

Specifically, Schreiber testified as follows:

For example I searched the words "digital video" and the there's a first use and last use of digital video. It is about ten columns. And the words are English, but the meaning is gibberish. In fact, this section is so confused that I had both of my colleagues, Bove and Bender at MIT, who are also working on this case, to read this section and tell me what they thought it meant. It means nothing. No one, no engineer who had any knowledge at all of the design of systems, television systems, would possibly use this method. These ten columns are devoted to a basic element in the system, the means by which a viewer who has paid for a program gets to see it, in this case Wall Street Week at 8:30. I paid the money, now I want to watch the program. And the process that is gone through by the system where the studio alternates between transmitting analog and video and so many other things happen, and at one point if they discover that tampering has taken place they permanently disable the receiver. I mean all sorts of things are thrown in there that make so sense whatsoever. Anyway.

* * *

THE WITNESS: The section I was referring to starts in column 162 and, I believe, toward the top.

JUDGE LUCKERN: That would be line.

THE WITNESS: Maybe line nine. And it continues, I believe, through column 172, line 55.

* * *

THE WITNESS: What I was going to say, to put it mildly, this discussion of digital video is not enabling. It is, as far as I know, it's the only discussion in the patent that really talks about other than standard analog video. And it does it in the manner that I have just described.

(FF 535).

In addition, the administrative law judge finds that the claims in issue, the specification of the '277 patent, and the specification of the '490 patent do not necessarily use the same vocabulary. Thus, he finds terms in the claims in issue that were never used in the some 557 page specification of the '277 patent, nor were they used in the '490 specification. He also finds other phrases in the claims in issue that appear to be used differently in the specification of the '277 patent than in the claims in issue. Also, in certain instances he finds almost no definitions in the specification of the '277 patent for claimed terms.

As the staff argued in its opening argument, the administrative law judge finds that the specification of the '277 patent is difficult to understand, as it is dealing with many possible systems; that, despite complainant's attempts to point to the specification of the '277 patent as illustrative of some claim elements, said specification has not been helpful in connecting individual claim language to distinct statements in the specification of the '277 patent that is supposed to provide an explanation of the claimed systems in issue; that complainant's assertions in many instances of where support in the specification of the '277 patent can be found for claimed elements "reads like the directions to a treasure hunt. There's a piece here, there's a piece there, it's in there somewhere." (Tr. 155 to 158); and

that the specification of the '277 patent and the claims in issue "are like ships passing in the night in the same ocean, but not necessarily sailing in the same direction." (Tr. at 158).

Complainant in its CFF 1115 relies on certain testimony of respondents' expert Schreiber to show that one of ordinary skill in the art would have been able to build a system operating in the manner claimed in each of claims 6, 7 and 44 of the '277 patent.

Complainant, however, in its CFF 1115 omitted a key portion of Schreiber's testimony, viz. that a person skilled in the art in 1981 would not have been helped by the '277 patent specification and, in some cases, would have been seriously misled. (FF 532). Schreiber did testify that a person of ordinary skill in the art who was given a modulation method could have designed a suitable circuit for a device. However, he also testified that one of ordinary skill in the art in 1981 would not have been able to make the "digital detector" of each of claims 6, 7 and 44 in issue because there is no indication in the specification of how the digital information is modulated or how it is detected. (FF 533). Complainant also -- relies on certain testimony of its expert Davis in its CFF 116 for the proposition that one skilled in the art in 1981 would have had no difficulty designing the digital detectors disclosed in the '277 patent, viz. path A and path B of Figure 2A, to accomplish the function of the digital detectors in Figure 2A of the '277 patent (FF 540). However, the cited hearing transcript does not state that the specification would enable one of skill in the art to design two circuits. Thus, Davis testified:

Q Just so we're clear, Dr. Davis, in 1981 -- and you were one of ordinary skill in '81 -- if you looked at this and you knew that we're doing path A, would you have any problem designing a digital detector to deal with path A?

A No, sir.

Q What about path B, the audio, would you have any problem designing, from your knowledge, what you knew at the time, designing a digital detector that would work in box 37, which is path B?

A No, I don't think I would.

JUDGE LUCKERN: For the record, Mr. Ruyak is looking at figure 2A of the '490 patent.⁶¹ Please proceed, Mr. Ruyak.

(FF 340). However, testimony of other experts confirms that, while a person of ordinary skill in the art may have been able to construct a system as claimed in each of claims 6, 7 and 44,⁶² the evidence of record does not support a finding that the specification of the '277 patent would have enabled one of ordinary skill in the art to make such a system. Thus, complainant's expert Williams testified that, while control of digital detector elements 34, 37 and 38 was an important feature of the claimed inventions, the '277 specification did not contain any specific information as to how said digital detector elements of the '277 specification are controlled. Williams testified as follows:

Q Dr. Williams, in figure 2A, there are input control information lines which go into line receiver 33, digital detector 34 and digital detectors 37 and 38. Do you see those?

A Yes, I do.

Q Does the patent -- the '277 patent or the '490 patent, do they define how those particular elements, 34, 33, 37 and 38, are controlled?

A I don't recall precisely them saying that these are controlled -- precisely how they are controlled.

⁶¹ Figure 2A of the '490 patent is substantially similar to figure 2A of the '277 patent (CX 2 CX 3).

⁶² As detailed, *infra*, prior art of record anticipates claim 7. Thus, the administrative law judge finds that there is evidence of record that a person of ordinary skill in the art, without reference to the '277 patent, would be able to construct a system as defined by at least claim 7.

Q Control of these elements is an important feature with respect to understanding the alleged invention in this patent, isn't it?

A The person who designed this system who used this technique would have to know how to control these.

Q There's no information in these patents that tells us how to control these elements in order to detect signals in various locations or detect signals in various timing patterns. It's just not -- there's no information that tells a reader how to do that, is there?

A Certainly there's some examples of where the signals may be -- some examples of where to find the signal. But specifics of how to build this device or control this device. I don't think that's in there.

(FF 534) (emphasis added). Similarly, respondents' Crowther testified that, to make the invention of claim 6, he would have to speculate, invent circuitry, or at least experiment, to develop a working system, and that the specification would provide no guidance in that endeavor. Thus, he testified:

The passages I just read provide absolutely no detail informing one of ordinary skill in the art how to change the operation of any digital detector, nor does it describe how a controller could be programmed to cause the change in the operation of the digital detector.

In my opinion, if I were going to make the invention of claim 6, I would first have to speculate as to what the claim was describing, then I would have to draft a proper specification, then invent circuitry or at least experiment with standard computer techniques to develop a working system. The teaching of the patent would provide no guidance to me in this endeavor.

(FF 339) (emphasis added). In addition, with respect to Figures 2B and 2C of the '277 patent, respondents' Schreiber testified as follows:

Q And we've looked at figure 2A extensively. I showed you figure 2B a moment ago. Let me put figure 2C on the board.

* * *

Q Figure 2C is described in the text of the patent as being just a potential circuit for extracting the digital control signal from some other kind of receiver, not a radio and not a television; isn't that right?

A Figure 2C doesn't tell me, like figure 2B, tells me nothing about what the circuit is supposed to look like.

Q Irrespective of what it tells you about what the circuit is supposed to look at, I am correct, am I not, that the patent tells us that one trying to achieve the objectives of the patent can use figure 2C and can extract control signals from transmissions, other than television or radio?

A Well, it's an idea thrown out. I mean, it's not at all an instruction that a person of ordinary skill in the art could use to do anything.

(FF 532) (emphasis added). Significantly, the administrative law judge finds that the experts who testified at the hearing were unable to state that, based on the '277 patent specification, one of skill in the art would be enabled to construct a device that corresponded to the "digital detector" recited in each of the claims in issue.

Complainant's expert Williams did testify that he would expect that digital detector 38 of Figure 2A of the '277 patent "possibly" would include a tuner, demodulator and a digital processor based upon the functions it is to perform. (FF 542). However, he admitted that there is "nowhere in either the '490 or the '277 patent where a digital detector is expressly defined as having a tuner, a demodulator and a comparator." (Williams, Tr at 554). Moreover, the '277 patent specification describes and claims tuners and demodulators as distinct from digital detector. (FF 543).

The administrative law judge also finds no witness at the hearing that has testified that a device known as a "digital detector" was commercially available as of 1981. While

complainant relies on testimony of Davidson, he testified, regarding his reissue patent

31,735, as follows:

- Q. Let me direct your attention, Mr. Davidson, to . . . the sentence that starts on line 45, "These signals are then delivered to an RF tuner coupled to an intermediate frequency (IF) amplifier and detector 40 which detects the scrambled television signals and to an RF tuner 42 coupled to an IF amplifier and detector 44 which detects the scrambled audio signals and the information signals."

Let's find a drawing with those blocks shown, and I think we will find it on page -- on Figure 3. Tell me what is meant by the IF amplifier and detector in box 44.

- A. The "IF" stands for intermediate frequency, meaning neither radio frequency nor audio frequency, but most likely a radio frequency in between that of the frequency used to transmit the signal over the air and the audio frequency. And it's an amplifier because the signal's weak coming in. It has to be brought to a level which allows reprocessing.

And "detector" is another word for "demodulator." It is the circuitry which removes the intelligence from the signal that had the intelligence modulated into it.

- Q. Do I understand Figure 3 correctly as follows: The video information and audio information are being detected in box 40 and sent on down to the video switching amplifier to determine whether or not to invert or uninvert lines. And the digital control information is being picked out on channel -- on a separate channel that is being detected in box 44?

- A. You are correct. That's exactly what's happening.

- Q. And can you elaborate a little bit on how one of ordinary skill in the art might go about extracting the digital information from the signal using IF amplifier and detector in box 44?

- A. In that IF amplifier and detector, one you've amplified your signal to a voltage level high enough to allow detection, you put it into what's referred to as an envelope detector in this case because it's amplitude modulated. If it were not, you would put it into a slope detector for frequency modulated.

But let's take our case. It's amplitude modulated. And you do use an envelope detector. And you extract the ones and the zeros that were encoded into this radio signal.

Q. Was that relatively standard circuitry that any engineer working in his field would have known how to do in 1977?

* * *

A. 1977, yes. In fact, we literally used equipment that was bought off the shelf to do that function.

(Davidson, RX 1006 at 86-89). Thus, the administrative law judge finds that Davidson's testimony was not directed to the "digital detector" disclosed in the '277 patent, but rather to an "envelope detector" disclosed in Davidson's patent which Davidson testified is the same as a "demodulator."

Based on the foregoing, the administrative law judge finds that the '277 specification does not provide reasonable detail for the "digital detector" elements of each of claim 6, 7 and 44 in issue and that the written description of the '277 patent specification does not communicate what is needed to enable one of ordinary skill in the art to understand and carry out the inventions of the claims in issue. Rather, the '277 specification, at most, "when combined with the knowledge in the art, would lead one to speculate as to modifications that the inventor might have envisioned, but failed to disclose" which is insufficient to meet the enablement requirement of 35 U.S.C. § 112, first paragraph. See Lockwood, 107 F.3d at 1572, 41 USPQ2d at 1966. Accordingly, the administrative law judge finds that respondents have established by clear and convincing evidence that each of claims 6, 7 and 44 is invalid under 35 U.S.C. § 112, first paragraph, because of the failure of the '277 specification to enable any person skilled in the art to make and use the invention of said claims in issue.

IX Each of Claims 6 and 7 Has Not Been Shown To Be Invalid Under 35 U.S.C. § 112, Second Paragraph Because Of The “Separately Defined” Limitation

The broadcasting respondents argued that claims 6 and 7 in issue require that the television transmission be “separately defined from standard analog video and audio television;” that the patentees by seeking to define the transmission by what it is not significantly obscure the meaning of claims 6 and 7; and that there are many possible gradations of difference and neither claims 6 nor 7 nor the specification define “how different” from standard television the transmission must be; and that accordingly the “separately defined” limitation renders each of claims 6 and 7 indefinite under 35 U.S.C. § 112, second paragraph. (BRBr at 101).⁶³

Complainant argued that the broadcasting respondents concede that negative definitions in claim language are not per se indefinite but than state without support that such claim language is “prone to be” indefinite (citing BRBr at 101); that neither the Examiner nor the experts who testified at the hearing had any trouble understanding the claimed phrase in issue; and that the experts agreed that said claimed phrase referred to a transmission that contained information other than standard television programming, such as Path C of Figure 2A of the ‘277 patent, or a digital television system containing control signals. (CRBr at 50-51).

Respondents have not cited any legal authority for the proposition that negative claim definitions are prone to be indefinite. To the contrary, the Manual of Patent Examining

⁶³ The manufacturing respondents adopted the arguments of the broadcasting respondents (MRRBr at 1).

Procedure, § 2173.05(i) (Sixth Edition, Rev. 2, July 1996), regarding “Negative Limitations” provides:

The current view of the courts is that there is nothing inherently ambiguous or uncertain about a negative limitation. So long as the boundaries of the patent protection sought are set forth definitely, albeit negatively, the claim complies with the requirements of 35 U.S.C. 112, second paragraph. [emphasis added]

Id. See also 3 Donald S. Chisum, Chisum on Patents, § 8.06[3] (1997), citing *In re Duva*, 387 F.2d 402, 156 U.S.P.Q. 90 (CCPA 1967). Moreover, as detailed *supra*, the specification, as well as the plain language of claims 6 and 7, provide a sufficient basis to allow the administrative law judge to define the claim phrase “separately defined from standard analog video and audio television. . .” In addition, in relation to the accused DSS system, respondents’ expert Schreiber testified as follows regarding the claim 6 and 7 phrase “separately defined from standard analog video and audio television:”

Well, the question is, is the DSS separately defined from analog? Of course it is. It is a digital video system. I mean you don’t have to go to deeply in the characteristics of the system to see it is a digital, therefore, it is not an analog system.

(Schreiber, Tr at 1415).

Based on the foregoing, the administrative law judge finds that respondents have failed to meet their burden in establishing that claims 6 and 7 in issue are invalid under 35 U.S.C. § 112, second paragraph because of the “separately defined” limitation.

X Claim 44 Has Not Been Shown To Be Invalid Under 35 U.S.C. §112, Second Paragraph, Because of Any Double Inclusion

The broadcasting respondents argued that no less than four times claim 44 introduces pairs of similar-sounding elements, each of the pairs being introduced by the indefinite article “a;” and that although each claim element introduced by an indefinite article is presumed to

refer to a distinct structure, the claim's repeated use of pairs of similar-sounding terms renders claim 44 "fatally" indefinite because upon encountering the second occurrence of each term "one is left to guess whether it refers to something different than what was defined earlier, or whether both terms can be satisfied by the same elements. Respondents, in support, rely on In re Kristensen, 10 U.S.P.Q.2d 1701, 1703 (Bd. Pat. App. & Inter. 1989) and Endveco Corp. v. Chicago Dynamic Indus., Inc. 268 F. Supp. 640, 654 (N.D. Ill. 1967) (finding 52 & conclusion 10) (BRBr at 102).⁶⁴

Complainant argued that claim 44 includes six elements: a television receiver, an input device, a digital detector, a mass medium receiver, a processor and a television display device which elements are described "capable of performing certain functions and as being 'operatively connected' in various ways" and hence there is no double inclusion.⁶⁵ (CRBr at 51).

The Court in In re Kelley, 305 F.2d 909, 134 U.S.P.Q. 397, 402 (CCPA 1962) reasoned:

The fact that one or more structural elements performing more than one function are common to the mechanisms which are recited separately in the claims does not prevent the claims from being sufficiently supported by the disclosure.

* * *

Automatic reliance upon a 'rule against double inclusion' will lead to as many unreasonable interpretations as will automatic reliance upon a 'rule allowing

⁶⁴ The manufacturing respondents adopted the arguments of the broadcasting respondents (MRRBr at 1).

⁶⁵ Complainant also argued that because respondents failed to present this argument in their Pre-Hearing Statement, the administrative law judge should reject the argument as untimely (CRBr at 51). Complainant, however, has had the opportunity to meet this argument. Accordingly complainant's argument on untimeliness is rejected.

double inclusion.' The governing consideration is not *double inclusion*, but rather is what is a reasonable construction of the language of the claims.

Id. See also Austin Powder Co. v. Atlas Powder Co., 219 U.S.P.Q. 707, 722-23 (D. Del. 1983). Respondents specifically object to the following elements of claim 44 as "double inclusion" elements (1) "a television receiver" and "a mass medium receiver," (2) "a selected broadcast or cablecast television transmission," and "a mass medium transmission," (3) "a television display" and "a television display device," and (4) "a processor" and "a processor."

(1) "a television receiver" and "a mass medium receiver."

Under claim construction, supra, the administrative law judge found that a "mass medium receiver" and a "television receiver" are distinct elements of claim 44. Under respondents' proposed claim construction, respondents argued as follows:

Although claim 44's references to both "a television receiver" and "a mass medium receiver" are somewhat confusing (as discussed in detail below), the "double inclusion" principle of *Holdsworth v. Goldsmith*, 129 F.2d 571, 575-76 (C.C.P.A. 1942), precludes the two references from being read on the same structure. Thus, as both parties' experts agree, claim 44 covers only systems with separately identifiable elements constituting a "television receiver," on one hand, and a "mass medium receiver," on the other.

(BRBr at 31-32) (footnote omitted) (emphasis in original).⁶⁶ Thus, respondents recognized

⁶⁶ Respondents cited the following testimony of complainant's expert Williams in support:

Q Move to the next element. It calls for a television receiver. What do you regard as the television receiver responsive to this part of the claim in connection with the Thomson unit?

A I believe that the television receiver that is responsive to this element is the receive portion of a standard consumer television set.

Q What do you mean by the receive portion?

that, under a proper interpretation of claim 44, the "mass medium receiver" and the "television receiver" are distinct elements of claim 44. Accordingly, the administrative law judge finds that respondents have failed to establish that claim 44 is Invalid under 35 U.S.C. § 112, second paragraph, because of a "double inclusion" related to "a television receiver" and "a mass medium receiver."

- (2) "a selected broadcast or cablecast television transmission," and "a mass medium transmission."

Under claim construction, supra, the administrative law judge found that "a selected broadcast or cablecast television transmission," is distinguishable from "a mass medium transmission" in the context of claim 44. Under their proposed claim construction, respondents argued that "claim 44 requires both a "broadcast or cablecast television program transmission" and a distinct "mass medium transmission." (BRBr at 32). Thus, respondents recognized that, under a proper interpretation of claim 44, the "broadcast or cablecast television program transmission" and the "mass medium transmission" are distinct requirements of claim 44. Accordingly, the administrative law judge finds that respondents have failed to establish that claim 44 is invalid under 35 U.S.C. §112, second paragraph,

A The tuner, the front end part of a standard consumer television set.

* * *

Q Mr. Micallef says I may have forgotten to ask you about the term mass medium receiver for detecting digital information in a mass medium transmission, how that is responded to in the Thomson box.

A I believe the satellite antenna in the low noise blocker does that. They receive the 32 transponder frequencies and select 16 and then move those 16 down to an intermediate frequency.

(Williams, Tr at 466, 472).

because of a “double inclusion” related to a “broadcast or cablecast television program transmission” and a “mass medium transmission.”

(3) “a television display” and “a television display device.”

Under claim construction, supra, the administrative law judge found that claim 44 requires a single “television display.” When interpreted in light of the plain language of claim 44, as well as the specification and the prosecution history, claim 44 requires a single display that is “operatively connected to said processor from receiving and displaying said video overlay” and which also receives from a television receiver “television programming.” Thus, the plain meaning of “video overlay,” supported by examples in the ‘277 specification, implies that “television programming” will be displayed such that a “video overlay” will be superimposed on top of said programming. See e.g. Figure 1C of the ‘277 patent.

Accordingly, the administrative law judge finds that respondents have failed to establish that claim 44 is invalid under 35 U.S.C. §112, second paragraph, because of a “double inclusion” related to a “television display device.”

(4) “a processor” and “a processor.”

Under claim construction, supra, the administrative law judge found that claim 44 requires a single “processor.” When interpreted in light of the plain language of claim 44, as well as the specification and the prosecution history, claim 44 requires, under the “digital detector” element, “transferring some of said detected information to a processor.”

Accordingly, the administrative law judge finds that respondents have failed to establish that claim 44 is invalid under 35 U.S.C. §112, second paragraph, because of a “double inclusion” related to a “processor.”

XI Claim 44 Has Not Been Shown To Be Invalid Under 35 U.S.C. § 112, First Paragraph Because The '277 Specification Does Not Provide Written-Description Support For A Device That Generates A Video Overlay Related To Information Of The Reaction Of A Viewer To Specific Television Program Content

The broadcasting respondents argued that although claim 44 calls for a device that generates a video overlay related to "information of the reaction of a viewer to specific television program content," the '277 patent specification does not describe a device having that function; and that while said specification describe some devices that receive inputs of viewer reaction in response to television program content and others that generate video overlays, there is no description of generating a video overlay related to an input of viewer reaction. (BRBr at 84, 85).⁶⁷

Complainant argued that respondents agree that the cooking show example of the '277 patent specification discloses the generation of a print-out related to viewer reaction information which print-out is caused by a SPAM signal that instructs the receiver to generate the print-out using the circuit of Figure 7; that the '277 patent specification states that the same circuit of Figure 7 can be used to generate video overlay information in response to a SPAM signal; that contrary to respondents' contention one of ordinary skill in the art would have understood that the system of Figure 7 could produce video overlays related to viewer reaction, instead of print-outs, simply by putting a different command in the SPAM signal; and thus that the circuit of Figure 7 can cause the generation of either a print-out or a video overlay in response to an appropriate SPAM signal. Complainant also argued that the '277 patent specification further illustrates that the system can be used to generate

⁶⁷ The manufacturing respondents adopted the arguments of the broadcasting respondents (MRRBr at 1).

either a print-out or video overlay information, depending on the SPAM signal that is sent. (CRBr at 40-41).

The staff argued that the Wall Street Week example of the '277 specification describes how programming delivered at different times to one place can be coordinated to give a multimedia presentation at one time in one place; that the Julia Child example of the '277 specification describes one method for co-ordinating the presentation of information through the use of print with video; that the '277 patent specification states that the systems described can control all local equipment and manage location presentations in any fashion feasible given the nature of the local equipment and the programming; and that based on the disclosure in the '277 patent specification and the relative similarity in said two examples respondents have not shown by clear and convincing evidence that a person of ordinary skill in the art would not have understood that the '277 patent included certain combinations of the related examples with respect to the claimed phrase in issue. (SBr at 68, 69).

The administrative law judge finds that the "Exotic Meals of India" example of the '277 patent specification is directed to "the subscriber of the station of Figs. 7 and 7F" and discloses the generation of a print-out related to viewer reaction information (CX 2, '277 patent at col. 261, ln. 36-col. 264, ln. 52); that the '277 specification also discloses, in relation to the "Exotic Meals of India" example, that "an alternate method for inputting said second message to the microcomputers, 205 . . . is to embed said message in a particular second transmission that is different from the transmission of said Exotic Meals of India programming. . . ." (CX 2, at col. 265, lns. 59-64); that the '277 specification further discloses that the same circuit of "Figs. 7 and 7F generates image information of a first

video overlay and generates selected information of subsequent overlays in the following fashion," (CX 2, at col. 270, lns. 35-39), see also, Figure 7, Figure 7F and CX 2 at col. 273, lns. 9-60); and that Figure 7 discloses an "earth station" 250 connected to "satellite receiver circuitry" 251 as a distinct input from a "multi-channel cable system."

Based on the foregoing the administrative law judge finds that the '277 patent specification does sufficiently describe a device that generates a video overlay related to "information of the reaction of a viewer to specific television program content."

XII Respondents Have Not Established That Claim 6 Is Invalid As Anticipated By Prior Art Under 35 U.S.C. § 102, Or Obvious Under 35 U.S.C. § 103

Under 35 U.S.C. § 282, a patent is presumptively valid, and the burden, under a "clear and convincing evidence" standard of proving invalidity rests on the accused infringer. Innovative Scuba Concepts Inc. v. Feder Industries Inc., 26 F.3d 1112, 31 U.S.P.Q.2d 1132, 1134 (Fed. Cir. 1994), citing Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.3d 1367, 1376, 231 U.S.P.Q. 81, 87 (Fed. Cir. 1986), cert. denied, 480 U.S. 947 (1987); Texas Instruments v. U.S. Intern. Trade Comm'n, 988 F.2d 1165, 1177, 26 U.S.P.Q.2d 1018, 1028 (Fed. Cir. 1993).

Anticipation "requires identity of invention: the claimed invention, as described in appropriately construed claims, must be the same of that as the reference, in order to anticipate." Glaverbe Societe Anonyme v. Northlake Marketing, 45 F.3d 1550, 1554, 33 U.S.P.Q.2d 1496, 1498 (Fed. Cir. 1995) (Glaverbe), Continental Can Co. USA, Inc. v. Monsanto Co., 948 F.2d 1264, 1267, 20 U.S.P.Q.2d 1746, 1748 (Fed. Cir. 1991). References must be accepted for what they actually teach, not for what they could have taught in hindsight. Panduit Corp. v. Dennison Mfg., Co., 774 F.2d at 1095, 227 U.S.P.Q.

at 345-46 (Fed. Cir. 1985) (Panduit). Anticipation is a question of fact. Glaverbe Societe Anonyme, 45 F.3d at 1554, 33 U.S.P.Q.2d at 1498, Shatterproof Glass Corp. v. Libby-Owens Ford Co., 758 F.2d 613, 619, 225 U.S.P.Q. 634, 637 (Fed. Cir. 1985).

Respondents argued that claim 6 is anticipated by pre-1981 "universal teletext decoders" "exemplified by the Marti and Clifford articles (RX 222 and RX 223)." (BRBr at 43-47). Respondents also argued that, if claim 6 is interpreted to apply to systems containing predetermined digital video signals multiplexed with other digitized television signals, then it is anticipated by the Iijima '369 patent. (BRBr at 44).^{68 69}

The staff argued that, based on the staff's claim construction, none of the prior art references cited by the respondents anticipate claim 6. (SRBr at 9).

⁶⁸ Respondents also argued that, if "location" is interpreted to cover "carrier frequency" then claim 6 is invalid as obvious, based on either (1) the combination of "Carrier-Frequency-Varying Analog Television With Embedded Digital Data" disclosed in the '131 Harney patent, the '089 Callais patent, and the '711 Cheung patent in combination with "closed captioning," or (2) the use of a system described in an article by Robert E. Kahn, et al., titled "Advances in Packet Radio Technology," appearing in the Proceedings of the IEEE, Volume 66, Number 11 (Nov. 1978) (the Kahn article) (RX 224) to transmit video images over a packet data network, using the combination suggested by J.C.R. Licklider & Albert Vezza, Applications of Information Networks, in Proceedings of the IEEE, Volume 66, Number 11, pp. 1330, 1332, 1338 (Nov. 1978) (RX 216).

In addition, respondents argued that U.S. Patent No. 4,908,859, naming Christopher J. Bennett et al. as inventors, titled "Receiver Access Interface to Service Components in Television Channel," issued March 13, 1990 and having an effective filing date of September 19, 1986, anticipates claim 6 if PMC fails to prove that it is entitled to an effective filing date of November 1981 for claim 6, and if "location" is interpreted to cover "carrier frequency".

The administrative law judge, under claim construction *supra*, found that "carrier frequency" is not "location" within the meaning of claim 6. Accordingly, he finds an analysis of the foregoing references unnecessary.

⁶⁹ The manufacturing respondents adopted the arguments made by the broadcasting respondents in their post-hearing submissions (MRRBr at 1).

Complainant argued that claim 6 is not anticipated by the prior art cited by respondents. (CRBr at 17).

1. The Marti and Clifford Articles

The Marti article relied on by respondents is a paper entitled "The Concept of a Universal 'Teletext' (broadcast and interactive Videotex) decoder, microprocessor based," published in 1979 as part of the Symposium Record of the Eleventh International Television Symposium (RX 222) (the Marti article). The Clifford article is a paper by Colin Clifford, titled "A Universal Controller For Text Display Systems," IEEE Transactions in Consumer Electronics, Vol. CE-25, No. 3, July 1979, pp. 424-429 (RX 223) (the Clifford article). Respondents refer to the Marti and Clifford articles as examples of "pre-1981 'universal teletext decoders.'" (BRBr at 43-44).

Complainant argued that the Marti and Clifford articles do not anticipate claim 6 because each fails to disclose, in a system, the following elements of claim 6: (1) a "predetermined signal intended for use by the receiver apparatus;" (2) a digital detector that detects "said predetermined signal in said transmission based on either a specific location or a specific time;" (3) a controller "for causing said [digital] detector to detect said predetermined signal based on either a specific location or time;" and (4) a "controller being programmed with either the varying locations or the varying timing pattern of said [predetermined] signal." (CRBr at 17-19).

The staff argued that the Marti article does not anticipate claim 6 because it fails to disclose (1) a digital detector that detects "said predetermined signal in said transmission based on either a specific location or a specific time," and (2) a "controller being

programmed with either the varying locations or the varying timing pattern of said [predetermined] signal.” (SBr at 50).

Under claim construction, supra, the administrative law judge found that a “controller” within the meaning of claim 6 requires a programmable device, that has “buffer, microprocessor, ROM, and RAM capacities,” and that “location,” as the word is used in claim 6, would include a line, or lines, or portions of a line in the vertical interval of a television video transmission, or a frequency within the audio range of a television transmission.

Based on the administrative law judge’s review of the Marti article, and the Clifford article, and his claim construction detailed supra, he finds, as detailed infra, that the Marti article, and the Clifford article, fail to disclose in a system, at least a “controller being programmed with either the varying locations or the varying timing pattern of said [predetermined] signal” (CRBr at 18, SBr at 50), and therefore claim 6 is not anticipated by “universal teletext decoders” under § 102(b).⁷⁰

a. Marti Article

The Marti article discloses a processing unit, which is a microprocessor with its program in a R O M [read only memory] (or in a R A M) [random access memory].” (RX 222 at 5). Said processing unit includes a microprocessor that receives codes from the buffer and interprets them, fills the “page store” (a memory device), interprets inputs from the keyboard, and initializes the data demultiplexor. (FF 621). Moreover, “the data

⁷⁰ Anticipation under 35 U.S.C. § 102 “requires identity of invention.” See e.g. Glaverbe, 45 F.3d at 1554, 33 U.S.P.Q.2d at 1498. Thus, the administrative law judge finds it unnecessary to examine each element of claim 6, as he has determined that each of the Marti and Clifford articles fails to disclose at least one element of claim 6.

demultiplexor receives the data from the demodulator and from the processing unit the following information: the value of the framing word, . . . an indication is necessary to say that it will be a Teletext service. . . ." (FF 621). Marti testified as follows regarding the disclosure of a signal with a varying location in his paper:

Q I don't want to spend the time to go through all of the elements, but let me ask you, what did you find to be the varying location of the signal [in the Marti article] based upon which the detection of the data occurs?

A The varying location, if my interpretation of the word "location" is correct, may refer to the various lines of the television signal, some of the lines being devoted to the transport of data and some of the lines being devoted to the transport of image. And, of course, depending for instance on the mode, the VBI mode which identified a certain set of lines or the full field mode which identifies another set of lines, you have different places in the signal if I can use the word place, which I don't like, various locations if you want me to use that in the signal where you have to look for the teletext or data signals.

Q Just so I understand, why don't you like using the word place or location in this context?

A Well, because we are working on a signal and a signal is a time dependent value, not a space dependent value, and the form of the word in Latin location means space. I guess that is also a language you don't know in this court, but location comes from Latin, locus, which means a place.

(Marti, Tr at 2129-33) (emphasis added). The Marti article further provides that "[i]n the case of 'short prefix' systems, it receives from the data demultiplexor an information saying that it must wait for data lines only during the field blanking interval. . ." While the "field blanking interval" is a "location" within the meaning of claim 6, the administrative law judge finds no other part of the Marti article that shows an "alternate" or "varying" location that the "controller" is programmed with. Based on the foregoing, the administrative law judge finds that respondents have failed to establish by clear and convincing evidence that the

Marti article discloses a “controller being programmed with either the varying locations or the varying timing pattern” of a “predetermined signal” as required by claim 6 or that the Marti article describes the invention of claim 6 sufficiently to a person of ordinary skill in the field.

b. Clifford Article

The Clifford article discloses a “microprocessor” which is a “controller” within the meaning of claim 6. (RX 223, at TCE 01000018333, figure 6). It teaches that “[t]he role of the microprocessor is to transcode from an arbitrary protocol to a fixed format required by the display controller.” (RX 223, at TCE 01000018337). Respondents rely on, *inter alia*, the following finding to rebut complainant’s proposed finding that Clifford “does not disclose a ‘controller being programmed with either the varying locations or the varying timing pattern of said signal.’” (emphasis in original) (CFF 925):

BRCFF 925. Like the Marti reference, the controller in the Clifford reference is programmed with the framing code corresponding to the selected format teletext signal, which indicates the location of the predetermined signal. (RX 223, Figure 11).

(BRCFF 925). However, respondents do not point to any testimony, or other evidence of record that Figure 11 of the Clifford article would suggest to one of skill in the art that the microprocessor of Clifford is programmed with the varying location or timing pattern of signals.

Based on the foregoing, the administrative law judge finds that respondents have failed to establish by clear and convincing evidence that the Clifford article discloses a “controller being programmed with either the varying locations or the varying timing pattern” (emphasis added) of a “predetermined signal” as required by claim 6.

2. Iijima Patent

Each of complainant and the staff argued that the system of the Iijima patent does not identify a predetermined signal (SBr at 51-52, CBr at 94).

Respondents argued that, if claim 6 is interpreted to apply to systems containing predetermined digital video signals multiplexed with other digitized television signals, then it is anticipated by the Iijima '369 patent (BRBr at 44). Respondents also argued that, although the predetermined signal must be in addition to, and therefore different from, the video and audio signals which make the transmission a "television program transmission," there is no reason that the embedded, "predetermined signal" cannot be a second video or audio signal; and that respondents believe Iijima's second television signal is a predetermined signal because there would still be a television program transmission (i.e., the first television signal) if the second signal were removed (BRRBr at 9, fn. 2).

The administrative law judge found, supra, under claim construction that the phrase "predetermined signal" as used in claim 6, requires a digital "detectable physical quantity or impulse (as a voltage, current, magnetic field strength) by which messages or information can be transmitted" in a television program transmission, or "data that are transferred over a given communications system by visual or aural means," which is something less than an entire "television program transmission," and which is determined, decided, or established in advance. Based on that interpretation of "predetermined signal," the administrative law judge rejects respondents' argument that "Iijima's second television signal is a predetermined signal," as inconsistent with the requirement that the "predetermined signal" is something less than an entire "television program transmission."

Based on the foregoing, the administrative law judge finds that respondents have failed to establish by clear and convincing evidence that the Iijima patent discloses a system for identifying a "predetermined signal" as required by claim 6. Accordingly, the administrative law judge finds that claim 6 is not anticipated by the Iijima patent.

XIII Respondents Have Established That Claim 7 Is Invalid As Anticipated By Prior Art Under 35 U.S.C. § 102

Respondents argued that the following "systems" anticipate claim 7: (1) the UK Teletext system, including its adaptation for the United States using an approach known as "gearing," (2) an extension of UK Teletext for delivering software to viewers' homes, known as "telesoftware," (3) the French Antiope system, as transmitted with television programs using a transmission protocol known as Didon, (4) the two "universal teletext decoders" capable of receiving multiple teletext protocols, and (5) the closed captioning system (BRBr at 56).

1. The "UK Teletext System"

Respondents argued that the "UK Teletext" system includes: (a) an article by Gerald Crowther, titled "Teletext and Viewdata Systems and Their Possible Extension to Europe and USA," IEEE Transactions on Consumer Electronics, Vol. CE-25, No. 3, July 1979, pp. 288-294 (the Crowther article) (RX 163 at 288-294)⁷¹ and (b) the Mullard chip, as offered

⁷¹ Respondents (BRBr at 56) cite to "RX 161," as "the Crowther article." RX 161 is an article by Crowther, bearing the same title as RX 163 at 288-294. However, RX 163 is the IEEE Transactions on Consumer Electronics, Vol. CE-25, No. 3, July 1979, which respondents cite as the publication containing the "Crowther article." Moreover, RX 161 does not contain an express publication date, although the cover page is dated 1979, and the third page bears a legend "RECEIVED BY W.S. CICIORA Jun 5 1979, Zenith Radio Corp." indicating that it was received by respondents' expert Ciciora on June 5, 1979 (RX 161 at 3). The administrative law judge will rely on RX 163, and not RX 161, because RX 163 has a stated publication date.

for sale and sold in the United States and documented in Mullard, Technical Publication (M81-0001), LSI circuits for teletext and viewdata—THE LUCY GENERATION (RX 180) and earlier Mullard chip set data sheets for the SAA5020, SAA5030, and SAA5040. (RX 165, RX 166, and RX 167).

The "teletext" system, in general terms, is a system that allowed for the display of alphanumeric and graphic information on television sets, either in place of a standard television video image, or superimposed over the television video image (N. Williams, Tr at 2356 - 58).⁷² Teletext information is generally displayed on the same television display device as ordinary television programming, but consists mainly of alphanumeric characters and graphics. (N. Williams, RX 178, Q. 42 at p. 7) The alphanumeric and graphic information is transferred to a television set by means of a decoder that receives digital information transmitted in portions of a television broadcast that are not used for standard video and audio television signals, generally a portion of the transmission known as the vertical blanking interval. (RX 142 at pp. 11-12). The teletext systems of different countries vary, with the "UK Teletext" and the French "Antiope" systems being examples of two "teletext" systems.

⁷² An article by Ciciora, et al. titled "An Introduction to Teletext and Viewdata With Comments on Compatibility" published in IEEE Transactions on Consumer Electronics, Vol. CE-25, No. 3, July 1979, contains the following definition of "teletext:"

A medium for transmitting text and simple graphics. The usual display is a color TV receiver. The information is digitally encoded for transmission. The information is organized into pages.

The digital code is embedded in a television signal and cyclically repeated. The receiver grabs the page of interest and stores it locally.

(RX 163 at 238, Fig. 1, titled "Definition of teletext").

a. Crowther Article

Complainant argued that the Crowther article does not disclose a controller causing a detector to locate, detect or output a specific signal; that the Crowther article fails to disclose a controller that controls a technique for assembling message units; that the Crowther article fails to disclose a controller programmed with information of the composition of said signal or with either the varying location or the varying timing pattern of said signal; that the Crowther article does not disclose the assembly of information or instruction message units that are intended for use by the receiver apparatus; and that the Crowther article does not disclose detecting specific digital control signals for use by the signal processing apparatus or assembling such signals into information or instruction message units for use by the system (CRBr at 26-27).⁷³

The staff argued that the UK teletext system, described by the Crowther article, contains all of the elements of the system of claim 7 (SBr at 58).

1. The Claimed "Specific Signal In A Television Program Transmission."

Complainant argued that the teletext data in the Crowther article is "programming and is not a control signal." (CRFF at 363). As the administrative law judge found supra, under claim construction, the "specific signal" of claim 7 is not limited to a "control signal."

The administrative law judge also found under claim construction, supra, that "specific signal" in claim 7 has the same scope as "predetermined signal" in claim 6. Thus, claim 7 requires a system for identifying a digital "detectable physical quantity or impulse (as

⁷³ It is undisputed that the Crowther article was not cited to the Examiner during the prosecution of the '277 patent (BRFF 680, CRFF at 122).

a voltage, current, magnetic field strength) by which messages or information can be transmitted" in a television program transmission, or "data that are transferred over a given communications system by visual or aural means," which is something less than an entire "television program transmission," and which is determined, decided, or established in advance.

The Crowther article describes a system for locating or identifying a digital signal that is transmitted in a television program transmission. Thus, the article reads with respect to

Fig. 1:

The section marked Teletext demodulator is a linear circuit. It is in this section that the incoming video signal is converted into a digital signal and a synchronous clock. . . . The acquisition circuit selects the user-requested page from the incoming serial bit stream. It then converts the signal into bytes of information with an appropriate address and writes the data into a definite location in the page memory.

(RX 163 at 288). Hence, the administrative law judge finds that Crowther discloses a system for locating or identifying a "specific signal" within the meaning of claim 7.

2. The Claimed "Separately Defined From Standard Analog Video And Audio Television."

It is undisputed that the television transmission with teletext data embedded in the VBI, as disclosed in the Crowther article, is not "standard analog video and audio television." (BRFF 683, CRFF at 123). Thus, the administrative law judge finds that the Crowther article discloses this element of claim 7.

3. The Claimed "A Digital Detector For . . . Detecting Said Specific Signal At A Specific Location."

While equivalents under 35 U.S.C. § 112 sixth paragraph, may be a pertinent

consideration in the anticipation context,"⁷⁴ as explained in detail under "indefiniteness" supra; the administrative law judge does not find any structural recitation in the specification, as required under 35 U.S.C. § 112, sixth paragraph, and is therefore unable to define the claim phrase "digital detector" in relation to the "equivalent" of any structure disclosed in the '27 specification. Accordingly, the administrative law judge is only able to determine if the Crowther article discloses some structure that accomplishes the function of "receiving at least some information of said transmission and detecting said specific signal at a specific location or time."

The "Teletext demodulator" and "acquisition circuit" disclosed in Figure 1 of the Crowther article accomplish the function of receiving at least some information of a television program transmission and detecting a specific signal, viz, the teletext signal (RX 163 at 288). Complainant admitted that, while the Crowther reference does not disclose variability in the transmission of the teletext signals, the teletext signals are transmitted and detected at fixed locations that are determined at the time the system is designed (CRFF 1098). Thus, complainant's expert Davis testified regarding Crowther:

Q How does it locate the teletext signal if it doesn't do it on the basis of when and where it appears?

A It's my understanding that the digital detector portion is receiving all the teletext transmissions, and more than that. The teletext decoder that is being addressed here, as I understand it, is very simplistic in the sense that the teletext data comes in in predetermined, fixed locations, the predetermination being made at factory design time, and that in its normal operation, the teletext can be shifted around as this claim, as well as claim 6, would seem to require.

⁷⁴ See Robert L. Harmon Patents and the Federal Circuit § 5.6 (3rd Ed. 1994).

- Q When you say "predetermined," in that instance, you're not talking about a predetermined signal, I take it?
- A No, not predetermined signal. Somebody at the factory at design time says this is how we are going to do the transmission, and after that there was no variability.
- Q So that once you have a teletext decoder under Crowther, that decoder always looks for the teletext data signals at the same place, whenever it's in operation?
- A That's correct.

(Davis, Tr at 3281-82) (emphasis added). Accordingly, the administrative law judge finds that the Crowther article discloses a "digital detector" that detects a specific signal "at a specific location" as required by claim 7.⁷⁵

4. The Claimed "Storage Device."

Claim 7 further requires a "memory that can store digital information." (CRBr at 10, BRBr at 25, SRBr at 14). The Crowther article discloses a "page memory" that "holds a complete page of data in coded form (ASCII) whilst the character generator converts the digitally-coded signal stored in memory into video signal for display on the picture tube." (RX 163 at 288). Accordingly, the administrative law judge finds that the Crowther article discloses the claim 7 "storage device," viz, a "memory that can store digital information."

5. The Claimed "Assembling . . . Into Either Information Or Instruction Message Units."

The administrative law judge found under claim construction, supra, that claim 7

⁷⁵ While claim 6 requires a "predetermined signal" that is transmitted at a varying location, claim 7 does not contain that limitation. Moreover, while claim 6 requires a "digital detector for ... detecting said predetermined signal ... based on either a specific location or a specific time," claim 7 only requires a "digital detector for ... detecting said specific signal at a specific location or time." Thus, claim 7 does not require the digital detector to detect a signal based on its location.

requires the "storage device" to "take possession or delivery of" or "to take in" the "detected digital information" which may consist of "parts of signal units, whole signal units, or groups of partial or whole signal units or combinations" (emphasis added) (with a "signal unit" being a complete "information or instruction message unit"); and that the claimed "storage device" must also "put or join together" in "an orderly way with logical selection or sequence" the "detected digital information" to form either an "information or instruction message unit." The administrative law judge interpreted an "instruction message unit" as "something given by way of direction or order" or "information in the form of an outline of procedures: directions" and thus would refer to information actually used to convey commands or instructions. In contrast, an "information message unit" is a reference to data or information that is not an "instruction."

Complainant argued that the "acquisition unit simply writes data into the page memory based on address information contained in the header of the teletext signals;" and that "there is not even an attempt to form the data into complete message units as required" by claim 7. (CRBr at 27).

The administrative law judge finds that the Crowther article does disclose the assembly of data into complete message units, as required by claim 7. Thus, the teletext data is transferred to a storage device, the page store, where the data is stored in specific memory locations in ASCII form under the control of the processor in the acquisition unit (RX 163 at 289). Because individual rows of a teletext page may contain errors, the system must sometimes wait for the same text to arrive again in order to construct an entire teletext page. Specifically, the Crowther article reads:

It is recognised that a page of data will be made up to several packets of data and that certain address information would be common to every packet. To economise in transmission time, two types of packet are defined as shown in Fig. 2.

The R_0 packet contains all the common address information for a page of text consisting of several packets of data. The R_0 packet marks the start and finish of a page.

The data to be transmitted may then be divided into a maximum of 32 packets with a unique address location in the decoder memory. In the packets labeled R_1 to R_{31} , minimum addressing is incorporated to identify the packet. In this manner the throughput of data is maximised. It should be recognised that one unrequired address bit per packet represents the loss of approximately one packet of message data per page.

* * *

There are three instances where the fixed relationship between the transmitted data and display data on a tv line is of importance. The first is when the user requests a new page; that second when errors occur in the transmission; and lastly, in the future when full channel Teletext transmissions are implemented.

* * *

More important, is to examine the effects of errors in a transmission. If errors occur in any Teletext system, either detected or undetected, the only possible action is to wait for a repeat transmission. Furthermore, since errors are likely to be caused by noise, probably aided by other distortion phenomena (reflections, asymmetric distortions in equipment, and co-channel interference), it is probable that the next reception of the required text will contain errors but in new locations. Advantage can be taken of this fact if the coding system is well chosen. It can be arranged that an integration of correct text automatically takes place by the use of simple parity checks over two or three receptions of the wanted data. For this to be achieved, it is vital that the page selection and the page formatting information are protected against disturbance. Hamming codes for the protection and correct of the address data are employed. The correct is important in that it ensures that the following valid "good" data is not rejected due to a 1 bit error in the address with a consequent extension of the access time of a specific page.

(RX 163 at p. 290). Thus, the administrative law judge finds that the "acquisition unit" disclosed in the Crowther controls the building of a complete teletext page from disparate packets of data, by selectively addressing the data page store, checking the data for errors, and controlling "the integration of correct text automatically . . . by the use of simple parity checks over two or three receptions of the wanted data." (RX 163, Fig. 5). Moreover "[i]ncoming information is only written into memory after a comparison between it and the data already stored and the status bit." (RX 163 at 291).

The Crowther article further discloses assembling a page of teletext in the page store according to one of the "gearing" schemes described in Figures 9-11 of the Crowther article (RX 163 at 292, Fig. 9, 10, and 11) see also Ciciora, Tr at 2634-38. Thus, Crowther discloses digital data received in pieces, and assembled into a complete lines or pages of teletext. Accordingly, contrary to arguments of complainant, the administrative law judge finds that the Crowther article discloses assembling digital information into "information . . . message units" as required by claim 7.

6. The Claimed "A Controller . . . Programmed With Information Of The Composition Of Said Signal"⁷⁶

Under claim construction, supra, the administrative law judge found that the "controller" of claim 7 is a programmable device that may have "buffer, microprocessor,

⁷⁶ Claim 6 requires a "controller" that is "for causing said detector to detect" said signal and is "programmed with either the varying locations or the varying timing pattern of said signal a (emphasis added). In contrast, claim 7 requires a "controller" that is "for causing said detector to locate, detect or output said signal" and is "programmed with information of the composition of said signal or with either the varying locations or varying timing pattern of said signal." (emphasis added). Thus, it is not a requirement of claim 7 that the controller cause the detector to detect said signal, nor is it a requirement of claim 7 that the controller be programmed with the varying location of said signal.

ROM, and RAM capacities" (CX 2, '277 patent at col. 22, ln 37-38). Moreover, the specific language of claim 7 requires that the controller be programmed with either information of the "composition" or the "varying location" or the "varying timing pattern" of the specific signal.

The Crowther article discloses an acquisition unit programmed with the composition of the teletext signal detected, namely the page number within the magazine for the information sought. (RX 163 at 288-89, Ciciora, Tr 2638; RX 423). Accordingly, the administrative law judge finds that Crowther discloses the claim 7 requirement that the controller be "programmed with information of the composition of said signal."

Based on the foregoing, the administrative law judge finds that the Crowther article discloses each element of claim 7, and therefore that respondents have established by clear and convincing evidence that said Crowther article anticipates claim 7 under 35 U.S.C. § 102.

b. Mullard Documents

Respondents and the staff also have argued that the "UK teletext" was demonstrated, offered for sale, and sold in the United States as documented in Mullard, Technical Publication (M81-0001), LSI circuits for teletext and viewdata—THE LUCY GENERATION (RX 180) and earlier Mullard chip set data sheets for the SAA5020, SAA5030, and SAA5040 (RX 165, RX 166, and RX 167) (the Mullard documents). (SBr at 56 - 58, BRBr at 56-58). Complainant argued that respondents presented no clear and convincing evidence that the public, by exercising reasonable diligence, could have had access to the Mullard documents. (CRBr at 28).

Complainant did not object to the following proposed findings of the staff:

285. UK teletext was demonstrated and described at the Spring Conference of the IEEE Transactions on Consumer Electronics in both 1979 and 1980, and at the National Association of Broadcasters shows in Dallas in 1979 and Las Vegas in 1981. RX-142 (Crowther W.S.) Q. 37 at p. 22; RX-178 (N. Williams W.S.) Q. 56-61 at pp. 10-11.

286. The demonstration of UK teletext in Las Vegas involved over-the-air broadcast signals with embedded teletext data sent by a local television station. RX-178 (N. Williams W.S.) Q. 62 at p. 11.

287. UK teletext system was the subject of field trials in St. Louis in 1979 intended to demonstrate the system to CBS. RX-142 (Crowther W.S.) Q. 37 at p. 22.

See CRFF at 324-325. Thus, based on complainant's acceptance of those proposed findings, and the record evidence cited in support thereof, the administrative law judge finds that "UK teletext" was demonstrated and described at the Spring Conference of the IEEE Transactions on Consumer Electronics in both 1979 and 1980, and at the National Association of Broadcasters shows in Dallas in 1979 and Las Vegas in 1981; that the demonstration in Las Vegas involved actual over-the-air broadcast signals with embedded teletext data sent by a local television station; and that the UK teletext system was the subject of field trials in St. Louis in 1979 intended to demonstrate the system to CBS. However, the administrative law judge does not find support in the record for respondents' reliance on the fact that said "UK teletext" demonstrated in the United States was "exactly" as documented in Mullard documents. Moreover, the administrative law judge finds that respondents have failed to present clear and convincing evidence that the Mullard documents were created for the public

and accessible to the public.⁷⁷ Accordingly, he finds that respondents have failed to present clear and convincing evidence that the Mullard documents anticipate claim 7 in issue.

2. Hedger Article

Respondents argued that claim 7 is anticipated by an extension of UK Teletext known as "telesoftware", as described in an article by J. Hedger, titled "Telesoftware: Home Computing Via Broadcast Teletext" published in July 1979 in the IEEE Transaction on Consumer Electronics, Vol. CE-25, No. 3, pp. 279-287 (the Hedger article) (RX 175) (CRBr at 58-62).

The staff argued that claim 7 is anticipated by the telesoftware system, as described in the Hedger article (RX 175).⁷⁸ (SBr at 58 to 60).

Complainant argued that neither the Hedger article, nor respondents' experts Ciciora and Hedger, suggest that the acquisition unit disclosed in the Hedger article causes a detector to locate, detect or output a specific signal; that the Hedger article also does not disclose a controller programmed with information of the composition of said signal or with either the varying location or the varying timing pattern of said signal; that the only information the system of the Hedger article might receive prior to receiving the transmission is the page number corresponding to a desired computer program that is entered by the user which gives no indication of the composition of the signal, or the location or timing pattern of the signal;

⁷⁷ See I William C. Robinson, The Law of Patents for Useful Inventions §§ 325-26 (1890). See generally Gerald Rose, Do You Have a "Printed Publication"? If Not, Do You Have Evidence of Prior "Knowledge or Use"?, 61 J. Pat Off. Soc'y 643 (1978); 1 Patent Practice ch. 4 (Irving Kayton ed., 5th ed. 1993).

⁷⁸ As noted by the staff, RX 163 at 279-287 is a more legible copy of the same Hedger article contained in RX 175.

that the Hedger article does not disclose a storage device for assembling message units; that the Hedger article does not say, and respondents' expert Hedger did not know, what occurs in the various memories; that the Hedger article does not disclose the assembling of message units that enable the decoder to perform a task; and that the computer programs described in the Hedger article are used by some apparatus other than the teletext decoder (i.e., the distinct microprocessor) (CRBr at 29).⁷⁹

a. The Claimed "Specific Signal In A Television Program Transmission."

Complainant argued that the teletext data in the Hedger article is "programming and is not a control signal" (CRFF 407). As the administrative law judge found supra, under claim continuation, the "specific signal" of claim 7 is not limited to a "control signal."

The administrative law judge also found under claim construction, supra, that "specific signal" in claim 7 has the same scope as "predetermined signal" in claim 6. Thus, claim 7 requires a system for identifying a digital "detectable physical quantity or impulse (as a voltage, current, magnetic field strength) by which messages or information can be transmitted" in a television program transmission, or "data that are transferred over a given communications system by visual or aural means," which is something less than an entire "television program transmission," and which is determined, decided, or established in advance.

The Hedger article describes a system for locating or identifying a digital signal that is transmitted in a television program transmission. Thus, the Hedger article describes a

⁷⁹ It is undisputed that the Hedger article was not cited to the Examiner during the prosecution of the '277 patent (BRFF 698, CRFF at 130).

system for transmitting data of a computer program in the vertical blanking interval of a television transmission. (RX 163 at 279). Accordingly the administrative law judge finds that the Hedger article discloses a "specific signal" within the meaning of claim 7.

b. The Claimed "Separately Defined From Standard Analog Video And Audio Television."

It is undisputed that the television transmission with data of a computer program embedded in the VBI, as disclosed in the Hedger article, is not "standard analog video and audio television." (BRFF 720, CRFF at 132-133). Thus, the administrative law judge finds that the Hedger article discloses this element of claim 7.

c. The Claimed "A Digital Detector For . . . Detecting Said Specific Signal At A Specific Location."

The administrative law judge found under claim construction, supra, that a "digital detector" is anything that accomplishes the function of "receiving at least some information of said transmission and detecting said specific signal at a specific location or time."

The administrative law judge finds that the video processor (VIP) and a portion of teletext acquisition unit (TAC) disclosed in the Hedger article perform the function of the "digital detector" required by claim 7. Thus, Hedger reads:

On the teletext card, the video processor, VIP, extracts data and data-clock information from the television composition video signal and feeds this to the teletext timing chain, TIC, and to the teletext acquisition and control, TAC. Working in conjunction with TIC, TAC selects the required page information and parallel--loads it to the page-store. Data in the page-store is fed to the character-generator, TROM, which generates red, green and blue colour signals for the television set when the page store is to be displayed.

(RX 163 at 281). See also RX 174 at 15. Thus, the VIP and TAC operate, under the control of a microprocessor of the processor card and the TAC, to locate, detect and output a

digital signal embedded in a specific location within a television program transmission, namely in the vertical blanking interval (See e.g. Ciciora, Tr at 2640-2642, RX 424).

Accordingly, the administrative law judge finds that the Hedger article discloses a “digital detector” that detects a specific signal “at a specific location” as required by claim 7.

d. The Claimed “A Storage Device.”

Claim 7 further requires a “memory that can store digital information.” (CRBr at 10 BRBr at 25, SRBr at 14). The Hedger article discloses a “page-store” a scratch pad RAM, and a secondary RAM (RX 163 at 280-81). Specifically, the Hedger paper reads:

The PAGE STORE is random-access memory (RAM) addressed by two bytes of indirect address; the first points to a row and the second to a column address. This memory would normally be used exclusively for teletext data storage.

The SCRATCH PAD is 256 bytes of RAM used as a temporary store between the page-store and

SECONDARY MEMORY which is another 4K bytes of RAM forming the main memory of the microprocessor.

Id. Accordingly, the administrative law judge finds that the Hedger article discloses the claim 7 “storage device,” viz. a “memory that can store digital information.”

e. The Claimed “Assembling . . . Into Either Information Or Instruction Message Units.”

The administrative law judge found under claim construction, supra, that claim 7 requires the “storage device” to “take possession or delivery of” or “to take in” the “detected digital information” which may consist of “parts of signal units, whole signal units, or groups of partial or whole signal units or combinations” (emphasis added) (with a “signal unit” being a complete “information or instruction message unit”), and that the

claimed "storage device" must also "put or join together" in "an orderly way with logical selection or sequence" the "detected digital information" to form either an "information or instruction message unit." The administrative law judge interpreted an "instruction message unit" as "something given by way of direction or order" or "information in the form of an outline of procedures: directions" and hence that it would refer to information actually used to convey commands or instructions. In contrast, an "information message unit" is a reference to data or information that is not an "instruction."

The system described in the Hedger article has a "page store" that receives telesoftware pages, the microprocessor then reads the page store and, if a telesoftware page is found the processor will read the bytes that have been stored in the page store into the scratch pad memory where the processor will check for errors. All valid bytes are then transferred to the secondary memory. Because the system does not always receive the first page of a program initially, address field data is included in the page of information to assist in the proper assembling of the program data. (Hedger, RX 174 at Q. 51-52). Specifically, the Hedger paper reads:

After reset, the processor will run the control program. In this mode, it will read the page store looking for a special sequence of characters which would normally be found only at the beginning of a telesoftware page. Until such a page has been found, processor has no effect upon normal operation and the system behaves like a standard teletext/TV receiver.

If a telesoftware page is selected and loaded into the page store, the processor will perform error checks upon the data before loading it into the correct part of secondary memory, via the scratch-pad. This process will be repeated for each new page received until all the pages which make up the complete program have been received.

If errors are detected, their location is noted and the erroneous bytes are retested on a subsequent pass.

Since programs generally need more than a single teletext page for transmission, they are divided into several pages which are broadcast in a pre-determined sequence using a single page-number. However, since the systems may not receive the first page of program initially, it has to be capable of loading the pages in any order. The pages contain special data to assist in this respect, described fully later.

(RX 163 at 281-82). Thus, the administrative law judge finds that the Hedger article discloses digital data received as individual bytes, and organized on several distinct pages. He further finds that the storage device disclosed in the Hedger article has the capacity to assemble these pieces of a computer program into one complete computer program that can be executed by the microprocessor (See RX 163 at 280, Fig. 1; Ciciora, Tr at 2642, RX 428). Accordingly, contrary to complainant's arguments, the administrative law judge finds that the Hedger article discloses assembling digital information into "information or instruction message units" as required by claim 7.

f. The Claimed "A Controller . . . Programmed With Information Of The Composition Of Said Signal"

Under claim construction, supra, the administrative law judge found that the "controller" of claim 7 is a programmable device that may have "buffer, microprocessor, ROM, and RAM capacities" (CX 2, at col. 22, ln 37-38). Moreover, the specific language of claim 7 requires that the controller be programmed with either information of the "composition" or the "varying location" or the "varying timing pattern" of the specific signal.

The administrative law judge further finds that the Hedger article discloses a "controller" operatively connected to a "storage device" and a "digital detector" as required by claim 7. Thus, the Hedger article discloses a microprocessor and TAC, which are

operatively connected to the VIP, the page store, the scratch pad RAM, and the secondary memory via the data bus. As quoted supra, the Hedger article teaches that the microprocessor controls the technique used to assemble message units (i.e., a software program) in the secondary RAM, and the TAC and the microprocessor cause the "digital detector" to detect, locate, and output the digital signals comprising the telesoftware program (RX 163 at 281-282).

The administrative law judge further finds that the microprocessor disclosed in the Hedger article is programmed with information of the composition of the telesoftware signal (the "specific signal"). Thus, the Hedger article states that "the processor will . . . read the page store looking for a special sequence of characters which would normally be found only at the beginning of a telesoftware page." In addition, the TAC is programmed with the page number of the selected telesoftware program (RX 163 at 281, Ciciora, Tr at 2640 - 2642, RX 424).

Accordingly, the administrative law judge finds that the Hedger article discloses the claim 7 requirement that the controller be "programmed with information of the composition of said signal."

Based on the foregoing, the administrative law judge finds that respondents have established by clear and convincing evidence that the Hedger article discloses each element of claim 7, and therefore anticipates claim 7 under 35 U.S.C. § 102.

3. Marti Article

Each of respondents and the staff argued that claim 7 in issue is anticipated by the "universal" teletext decoders as disclosed in the Marti article. (BRBr at 63-65) (SBr at 61).

Complainant argued that the Marti article does not describe a system that assembles detected digital information into either information or instruction message units that can be used to control the manner or mode of operation of the signal processing system (i.e., the teletext receiver); that Marti article discloses a system that detects and stores a page of teletext data for subsequent display on a television screen, and nowhere in the Marti article is there any description of the assembling of this data; that the Marti article does not disclose "a controller operatively connected to . . . said storage device . . . for controlling a technique used by said storage device to assemble message units" as required by claim 7; that the Marti article fails to describe any technique by which the display store is controlled by the microprocessor to assemble message units in a particular manner; that the Marti article also fails to disclose a controller programmed with the composition or varying location or timing pattern of the teletext signals; and that respondents argument that pages 7-9 of the Marti article disclose that the RAM or ROM of the processing unit "contains information concerning the composition and varying location of the digital teletext signal" is not supported by the said article, which merely describes the operation of software that may reside in the processor.⁸⁰ (SBr at 61).

The Marti article (RX 222) describes a "universal" teletext decoder "to accommodate any of the three existing standards." Thus, the Marti article reads:

several countries intend to set Videotex services into operation in the early 1980's. Unfortunately no international standards have been agreed on and services will be probably opened according to at least the three systems which are already known. Some countries claim they will experiment with such

⁸⁰ It is undisputed that the Marti article was not cited to Examiner during the prosecution of the '277 patent (BRFF 561, CRF 239).

services with a given system, reserving their final choice as a further decision.

So is it interesting to design, and to develop decoders capable to accommodate any of the three existing standards.

(RX 222 at 1.)

a. The Claimed "Specific Signal In A Television Program Transmission."

Complainant argued that the teletext data in the Marti article is "programming and is not a control signal." (CRFF 449) As the administrative law judge found supra, under claim construction, the "specific signal" of claim 7 is not limited to a "control signal."

The administrative law judge also found under claim construction, supra, that "specific signal" in claim 7 has the same scope as "predetermined signal" in claim 6. Thus, claim 7 requires a system for identifying a digital "detectable physical quantity or impulse (as a voltage, current, magnetic field strength) by which messages or information can be transmitted" in a television program transmission, or "data that are transferred over a given communications system by visual or aural means," which is something less than an entire "television program transmission," and which is determined, decided, or established in advance.

The Marti article discloses a system for decoding digital information transmitted the vertical blanking interval (VBI) of a television program transmission. (Crowther, RX 142, Q. 22 at pp. 11-12.).⁸¹ The system of the Marti article decodes this data so that it may generate

⁸¹ Complainant admits that "In the system described in the Marti reference, teletext programming is transmitted during the vertical blanking interval in a television transmission" (CRFF 238).

a picture (alphanumeric characters or graphics) for display on a television. Specifically, the Marti article teaches regarding the teletext data that:

The data transmitted do not represent directly the picture which is generated in the receiver, but encoded instructions to the receiving decoder. So the display representation conventions must be defined in a more detailed way, the meaning of a given byte, and even of a given string of bits depending not only on its own structure but also on its neighborhood.

(RX 222 at 1)(emphasis added). The Marti article also teaches that "The choice made in the design of such decoders is to implement a display processor dealing also with the decoding of Teletext display control codes." (RX 222 at 2).

Based on the foregoing, the administrative law judge finds that the Marti article teaches a system that identifies data, transmitted in a television program transmission, that represent "encoded instructions to the receiving decoder" that the decoder uses to generate a "picture" for display on a television and that the data are something less than an entire "television program transmission." In addition, the viewer of the teletext system determines what "picture" i.e. alphanumeric characters or graphics, the decoder will display, and thus the particular data is determined, decided, or established in advance. Thus, the administrative law judge finds that the Marti article discloses a system that satisfies the claim 7 requirement of a "system for identifying a specific signal in a television program transmission. . . ."

b. The Claimed "Separately Defined From Standard Analog Video And Audio Television."

It is undisputed that the television transmission with teletext data embedded in the VBI, as disclosed in the Marti article, is not "standard analog video and audio television." (BRFF 742, CRFF at 142). Hence, the administrative law judge finds the Marti article discloses this element of claim 7.

c. The Claimed "A Digital Detector For . . . Detecting Said Specific Signal At A Specific Location."

The administrative law judge found under claim construction, supra, that a "digital detector" is anything that accomplishes the function of "receiving at least some information of said transmission and detecting said specific signal at a specific location or time."

The Marti article teaches a "data demodulator" and a "data demultiplexor." The Marti article teaches that the function of the "data demodulator" as follows:

- the data demodulator receives the video signal with the data inserted in.

* * *

The output of this demodulator is a stream of demodulated serial data sliced out from the incoming video signal.

(FF 621) (emphasis added). The Marti article also teaches regarding the "data demultiplexor" that:

- The data demultiplexor receives the data from the demodulator and from the processing unit the following information: the value of the framing word, which indicates also, according to the E B U recommended transmission system, the kind of prefix used; the code of the data channel chosen by the user (3 bytes with the long prefix, 2 bytes for the medium prefix, 1 byte for the shortest one); when the intermediate prefix is used, an indication is necessary to say that it will be a Teletext service and, then the demultiplexor takes account of only 3 bits of the prefix. With the shortest and the longest prefix, the demultiplexor processes a format indication and transmits to the buffer from each data packets either the number of bytes indicated or the maximum format length if the format byte is received with a double error.

All the service bytes being Hamming protected, the demodulator checks whether they are correctly interpretable or not.

(FF 621) (emphasis added). Thus, there is a teaching in the Marti article that the data demodulator "receives the video signal with the data inserted in it" (the "television program

transmission" of claim 7). The Marti article also teaches that the "output of this demodulator is a stream of demodulated serial data" that the "data demultiplexor receives the data from the demodulator" and "processes a format indication and transmits to the buffer from each data packets either the number of bytes indicated or the maximum format length if the format byte is received with a double error."

Under claim construction, supra, the administrative law judge found that "location," as the word is used in claim 7, would include a line, or lines, or portions of a line in the vertical interval of a television video transmission, or a frequency within the audio range of a television transmission.

The Marti article teaches that a "universal" decoder must:

- be able to receive data from the Teletext system (1) on TV blanking lines and to display the corresponding pages (Ceefax or Oracle services).
- be able to receive data from the Didon (2) system, to interpret them according to the Antiope (3) language and to display the corresponding pages.

(RX 222 at 2).⁸² The Marti article also teaches regarding the "data demultiplexor" that:

In the case of "short prefix" systems, it receives from the data demultiplexer an information saying that it must wait for data lines only during the field blanking interval. This provision is absolutely necessary because, with a short prefix, it has been computed (see e.g. (6) or (7)) that the probability to capture at least one program line as data lines during one page transmission is 93% at the rate of 2 data lines per field. Its clock generator is adjusted to one of the values used (presently 6.2 and 6.9MHz).

⁸² The endnotes in the Marti article reference (1) "Broadcast Teletext Specifications - Published jointly by BBC, IBA and BREMA, septembre [sic] 1976," (2) "Y.NOIREL : Un système experimental de diffusion de données par paquets - Radiodiffusion Television n° 40, Nov/Dec 75," and (3) "C. SCHWARTZ : and al specifications préliminaires du système Antiope - Radiodiffusion Television n° 47, June 77."

The techniques used for choosing the tuning frequency are well known as they are already used in R E demodulators.

The output of this demodulator is a stream of demodulated serial data sliced out from the incoming video signal.

- The data demultiplexor receives the data from the demodulator and from the processing unit the following information: the value of the framing word, which indicates also, according to the E B U recommended transmission system, the kind of prefix used; the code of the data channel chosen by the user (3 bytes with the long prefix, 2 bytes for the medium prefix, 1 byte for the shortest one); when the intermediate prefix is used, an indication is necessary to say that it will be a Teletext service and, then the demultiplexor takes account of only 3 bits of the prefix. With the shortest and the longest prefix, the demultiplexor processes a format indication and transmits to the buffer from each data packets either the number of bytes indicated or the maximum format length if the format byte is received with a double error.

(FF 621). (emphasis added). Thus, the Marti article teaches that the decoder “receives from the data demultiplexer an information saying that it must wait for data lines only during the field blanking interval.” Based on the foregoing, the administrative law judge finds that the Marti article discloses a digital detector that detects data “at a specific location,” viz. “only during the field blanking interval.” Accordingly, the data demodulator and the data demultiplexer disclosed in the Marti article are a circuit that is for “receiving at least some information of [a television program transmission] and detecting said specific signal in said transmission at a specific location” as required by claim 7.

d. The Claimed “A Storage Device.”

Claim 7 further requires a “memory that can store digital information.” (CRBr at 10, BRBr at 25, SRBr at 14). The Marti article discloses a “page store” that stores character code data and function data. (RX 163 at 334-335, Fig. 1, 2, 4). Accordingly, the

administrative law judge finds that the Marti article discloses the claim 7 "storage device," viz, a "memory that can store digital information."

- e. The Claimed "Assembling . . . Into Either Information Or Instruction Message Units."

The administrative law judge found under claim construction, supra, that claim 7 requires the "storage device" to "take possession or delivery of" or "to take in" the "detected digital information" which may consist of "parts of signal units, whole signal units, or groups of partial or whole signal units or combinations" (emphasis added) (with a "signal unit" being a complete "information or instruction message unit"), and that the claimed "storage device" must also "put or join together" in "an orderly way with logical selection or sequence" the "detected digital information" to form either an "information or instruction message unit." The administrative law judge interpreted an "instruction message unit" as "something given by way of direction or order" or "information in the form of an outline of procedures: directions" and thus would refer to information actually used to convey commands or instructions. In contrast, an "information message unit" is a reference to data or information that is not an "instruction."

The system described in the Marti article has a page store that receives information of a selected format teletext signal and assembles the received information into a page of teletext. Thus, Marti testified:

- Q And again in each case does the right column reflect your opinion as to whether or not a particular colored element in the claim is present in one case in the Antiope system and in the other case the -- in the case of the decoder in your paper, RX 222?
- A Yes. Besides the reference in the text of some of the paragraphs the only new element in claim seven related to claim six is the presence of the storage

device. The analysis is roughly the same and of course the Antiope system implies the use -- when I say roughly is the same, of course this description is different in the claim six and in claim seven. But the main element which differs is the presence of a storage device, which I have shown to be present in the Antiope decoder. And the other element which is to my view important is the problem of sampling the data in that storage device. I think I have shown that the data which are coming to the buffer are then processed by the microprocessor to perform complex words of 16 bits which are different from the incoming bytes of information, and placed then into the memory to form the page.

Q Referring Figure 3 of your article, which is that chart right there that is marked RX 36 --

A 365.

Q 365. Could you point out the element of the decoder in your paper RX 222 that you believe corresponds to the storage device of claim seven?

A The storage device in my view is covered in the article the display store.

Q Did the Antiope decoder also have a display store with approximately the same function?

A It was exactly the same function.

Q What about the operation in the display store in the decoder recited in your paper did you believe constituted assembling at least some of the digital information into either information or instruction message units?

A Well, some of the information, some of the bytes which come in the decoder represent characters, and that is information. Some of the bites are control codes and these are instruction codes. These instruction codes are interpreted in a different way from the characters and the result of both operations are assembled together to form the 16-bit words I mentioned and placed into the memory.

(Marti, Tr 2135 - 2136). Thus, the Marti article discloses digital data received as individual bytes, wherein some of the bytes which come in the decoder represent characters, and other bytes are control codes. The storage device disclosed in the Marti article has the capacity, under control of the microprocessor, to assemble these pieces of data and control codes into

complete 16-bit words that represent complete information or instruction message units (See RX 222 at 6-7). Accordingly, contrary to the arguments of complainant, the administrative law judge finds that the Marti article discloses assembling digital information into "information . . . message units" as required by claim 7.

f. The Claimed "A Controller . . . Programmed With Information Of The Composition Of Said signal"

Under claim construction, supra, the administrative law judge found that the "controller" of claim 7 is a programmable device that may have "buffer, microprocessor, ROM, and RAM capacities" (CX 2, '277 patent at col. 22, ln 37-38). Moreover, the specific language of claim 7 requires that the controller be programmed with either information of the "composition" or the "varying location" or the "varying timing pattern" of the specific signal.

The processing unit disclosed in the Marti article "is a microprocessor with its program in a R O M [read only memory] (or in a R A M) [random access memory]." (RX 222 at 5). Said processing unit includes a microprocessor that receives codes from the buffer and interprets them, fills the "page store" (a memory device), interprets inputs from the keyboard, and initializes the data demultiplexor. (FF 621). Moreover, "the data demultiplexor receives the data from the demodulator and from the processing unit the following informations: the value of the framing word, . . . an indication is necessary to say that it will be a Teletext service. . . ." See also RX 222 at 7-9. Thus, the processor (the claimed controller) of the Marti article is programmed with composition information for a predetermined signal.

Based on the foregoing, the administrative law judge finds that the respondents have established by clear and convincing evidence that the Marti article discloses each element of claim 7, and therefore anticipates claim 7 under 35 U.S.C. § 102.

4. Clifford Article

Respondents argued that claim 7 in issue is anticipated by the "universal" teletext decoders as disclosed in the Clifford article (RX 223, RX 163 at 424-429).⁸³

Complainant argued that the Clifford article is directed towards developing a common set of display parameters for teletext display systems; that, similar to the Marti article the Clifford describes the reception of data and storage of that data as it is received; that the Clifford article does not discuss the assembly of information or instruction message units for controlling the operation of the signal processor; that the Clifford article contains no discussion of assembling the teletext data, or of a controller for "controlling a technique to assemble message units;" and that the Clifford article also fails to disclose a controller that is programmed with either the composition or varying location or varying timing pattern of the teletext signal. (CRBr at 32).⁸⁴

a. The Claimed "Specific Signal In A Television Program Transmission."

Complainant argued that the teletext data in the Clifford article is "programming and is not a control signal." (CRFF 449). As the administrative law judge found, supra, under claim construction, the "specific signal" of claim 7 is not limited to a "control signal."

⁸³ A more legible copy of the Clifford article is contained in RX 163 at pp. 424-429.

⁸⁴ It is undisputed that the Clifford article was not cited to the Examiner during the prosecution of the '277 patent (BRFF 561, CRF 239).

The administrative law judge also found under claim construction, supra, that "specific signal" in claim 7 has the same scope as "predetermined signal" in claim 6. Thus, claim 7 requires a system for identifying a digital "detectable physical quantity or impulse (as a voltage, current, magnetic field strength) by which messages or information can be transmitted" in a television program transmission, or "data that are transferred over a given communications system by visual or aural means," which is something less than an entire "television program transmission," and which is determined, decided, or established in advance.

The Clifford article discloses a system for decoding digital information transmitted in the vertical blanking interval (VBI) of a television program transmission. (RX 163). As with Marti, supra, the system of the Clifford article decodes this data so that it may generate a picture (alphanumeric characters or graphics) for display on a television. Based on the foregoing, the administrative law judge finds that the Clifford article teaches a system that identifies data, transmitted in a television program transmission, that the data are something less than an entire "television program transmission;" and that the viewer of the teletext system determines what alphanumeric characters or graphics, the decoder will display, and thus the particular data is determined, decided, or established in advance. Thus, the administrative law judge finds that the Clifford article discloses a system that satisfies the preamble of claim 7 requirement of "A system for identifying a specific signal in a television program transmission. . . ."

b. The Claimed "Separately Defined From Standard Analog Video And Audio Television."

It is undisputed that the television transmission with teletext data embedded in the VBI, as disclosed in the Clifford article, is not "standard analog video and audio television." (BRFF 742, CRFF at 142). Thus, the administrative law judge finds that the Clifford article discloses this element of claim 7.

c. The Claimed "A Digital Detector For . . . Detecting Said Specific Signal At A Specific Location."

The administrative law judge found under claim construction, supra, that a "digital detector" is anything that accomplishes the function of "receiving at least some information of said transmission and detecting said specific signal at a specific location or time."

The Clifford article discloses peak level detectors, a serial/parallel converter, a clock regeneration block, a framing code detector, a bus control unit, and a FIFO in a "teletext acquisition circuit," which, in combination, function, under the control of the microprocessor, to locate, detect and output a digital signal embedded in a specific location within a television program transmission.

Thus, the teletext data acquisition circuit, receives a "video input," which contains teletext information, and converts the information into digital data. The Clifford article reads:

The information transmitted in the television signal uses a non return to zero technique for encoding the data stream - both in Teletext and Antiope. The first 24 bits (3 bytes) of both concepts have the same function - they allow the synchronisation and detection of a valid transmission, figure 10 compares the two systems, unfortunately there is no further similarity between the systems.

The interpretation of the data, figure 10, is again a system variable and should be carried out by the microprocessor. The acquisition circuit provides the

necessary phase locking for the decoding clock and the detection of the framing byte (3rd byte). The following data is then assembled into bytes and transferred, byte at a time, into a buffer memory (FIFO).

Once the data has been assembled a signal informs the microprocessor; a check is then made as to whether this is the required page according to either the Teletext or Antiope standards. Further processing follows as necessary.

The video signal is processed by an averaging slicing circuit controlled by black and white level peak detectors. The circuit is adaptive and can provide good low error rates. The decoding clock is phase synchronised to the incoming data to accurately extract data.

(RX 163 at 428-429). See also RX 163 at 428, Figure 11. In addition, as shown in Figure 6 of the Clifford article, the "basic controller" includes (1) a teletext acquisition circuit, (2) a display memory, and (3) a microprocessor. The controller is designed to receive a television program transmission, and locate a digital signal in the transmission, and output a digital signal. The "basic controller" locates the teletext signal at a "specific location" in the VBI of a television program transmission. Accordingly, the administrative law judge finds that the Clifford article discloses a circuit that is for "receiving at least some information of [a television program transmission] and detecting said specific signal in said transmission at a specific location" as required by claim 7.

d. The Claimed "A Storage Device."

Claim 7 further requires a "memory that can store digital information." (CRBr at 10, BRBr at 25, SRBr at 14). The Clifford article discloses a "memory" that receives and stores digital information from specific teletext digital packets (RX 163 at 429). Accordingly, the administrative law judge finds that Clifford article discloses the claim 7 "storage device," viz, a "memory that can store digital information."

- e. The Claimed "Assembling . . . Into Either Information Or Instruction Message Units."

The administrative law judge found under claim construction, supra, that claim 7 requires the "storage device" to "take possession or delivery of" or "to take in" the "detected digital information" which may consist of "parts of signal units, whole signal units, or groups of partial or whole signal units or combinations" (emphasis added) (with a "signal unit" being a complete "information or instruction message unit"), and that the claimed "storage device" must also "put or join together" in "an orderly way with logical selection or sequence" the "detected digital information" to form either an "information or instruction message unit." The administrative law judge interpreted an "instruction message unit" as "something given by way of direction or order" or "information in the form of an outline of procedures: directions" and thus would refer to information actually used to convey commands or instructions. In contrast, an "information message unit" is a reference to data or information that is not an "instruction."

The Clifford article teaches that "the interpretation of the data . . . is again a system variable and should be carried out by the microprocessor." Thus, under control of the microprocessor, "data is . . . assembled into bytes and transferred, byte at a time, into a buffer memory (FIFO)." (RX 163 at 429). The processor then checks whether the data assembled in the FIFO is "the required page according to either the Teletext or Antiope standards" and if it is the correct page, the data is output from the FIFO. Id. The Clifford article also teaches that data output from the FIFO of the teletext acquisition circuit is received by the microprocessor and further assembled into a page of text in the 16 Kbit page (display) memory (RX 163 at 427). Accordingly, the administrative law judge, contrary to

arguments of complainant, finds that the Clifford article discloses assembling digital information into "information . . . message units," i.e. a page of teletext, as required by claim 7.

f. The Claimed "A Controller . . . Programmed With Information Of The Composition Of Said Signal"

Under claim construction, supra, the administrative law judge found that the "controller" of claim 7 is a programmable device that may have "buffer, microprocessor, ROM, and RAM capacities" (CX 2, '277 patent at col. 22, ln 37-38). Moreover, the specific language of claim 7 requires that the controller be programmed with either information of the "composition" or the "varying location" or the "varying timing pattern" of the specific signal.

The Clifford article discloses a "microprocessor" and teaches that "a suitably programmed microprocessor can thus translate any incoming protocol to an appropriate memory bit pattern for the display controller." (RX 163 at 427, 428). Thus, the microprocessor of the Clifford article is programmed with composition information for a specific signal.

Based on the foregoing, the administrative law judge finds that respondents have established by clear and convincing evidence that the Clifford article discloses each element of claim 7, and therefore anticipates claim 7 under 35 U.S.C. § 102.

3. Antiope/Didon System

Respondents argued that the French Antiope teletext system, as it existed and was demonstrated in the United States, and as described in, for example, the Frandon paper, disclosed all of the elements of claim 7. (BRBr at 62 to 65).

Complainant argued that the Frandon paper does not disclose a controller that is programmed to detect specific signals; that the data slicer described in Frandon extracts all teletext data received by the system and sends it to the processor, which sorts out which data to store and display; that the Frandon paper fails to disclose a controller for controlling the assembly of signals into information or instruction messages for use by the decoder apparatus; that the processor described in Frandon simply stores rows of teletext data in a page store based on address information received with the teletext data; that the Frandon paper also does not disclose a controller programmed with the composition or varying location or varying timing pattern of the teletext signal; that the processor of the Frandon paper is not programmed with the appropriate prefix and framing code, but rather, the Frandon paper clearly states that the prefix is received with the teletext packets; and that the framing code in the Frandon paper is generated in the data slicer. (CRBr at 30-31).

The staff argued that claim 7 is anticipated by the Antiope system, as described in the Frandon article (RX 229).⁸⁵ (SBr at 60-61).

a. The Claimed "Specific Signal In A Television Program Transmission."

The administrative law judge found under claim construction, supra, that "specific signal" in claim 7 has the same scope as "predetermined signal" in claim 6. Thus, claim 7 requires a system for identifying a digital "detectable physical quantity or impulse (as a voltage, current, magnetic field strength) by which messages or information can be transmitted" in a television program transmission, or "data that are transferred over a given communications system by visual or aural means," which is something less than an entire

⁸⁵ Exhibit RX 163 at 334-338 is a copy of the same Frandon article contained in RX 229.

"television program transmission," and which is determined, decided, or established in advance.

The Frandon paper describes a system for locating or identifying a digital signal that is transmitted in a television program transmission. Thus, the Frandon paper describes a system for transmitting "packets of data" in the active area of a television line in the vertical blanking interval of a television transmission. (RX 163 at 335). Hence, the Frandon paper discloses a "specific signal" within the meaning of claim 7.

b. The Claimed "Separately Defined From Standard Analog Video And Audio Television."

It is undisputed that the television transmission with teletext data embedded in the VBI, as disclosed in the Frandon paper, is not "standard analog video and audio television." (BRFF 728, CRFF at 136). Thus, the administrative law judge finds that the Frandon paper discloses this element of claim 7.

c. The Claimed "A Digital Detector For . . . Detecting Said Specific Signal At A Specific Location."

The administrative law judge found under claim construction, supra, that a "digital detector" is anything that accomplishes the function of "receiving at least some information of said transmission and detecting said specific signal at a specific location or time."

The administrative law judge finds that the "data slicer" and "prefix processor" disclosed in the Frandon paper perform the function of the "digital detector" required by claim 7. Thus, Frandon reads:

The data slicer (Fig. 2) extracts the bit clock from the video composite signal and sends prefix and data to the prefix processor after reshaping. The prefix processor separates data from prefix part of the packet and sends the data in byte form to the

buffer memory at the location defined by the Video Display Processor (VDP) time base.

(RX 163 at 335). Hence, the data slicer and the prefix processor operate, under the control of a "CPU", to locate, detect and output a digital signal embedded in a specific location within a television program transmission, namely in the vertical blanking interval (See e.g. RX 163 at 334-335, Figs. 1, 3, and 5). Accordingly, the administrative law judge finds that the Frandon paper discloses a "digital detector" that detects a specific signal "at a specific location" as required by claim 7.

d. The Claimed "A Storage Device."

Claim 7 further requires a "memory that can store digital information." (CRBr at 10, BRBr at 25, SRBr at 14). The Frandon paper discloses a random access "memory" that stores character code data and function data. (RX 163 at 334-335, Fig. 1, 2, 4). Accordingly, the administrative law judge finds that the Frandon paper discloses the claim 7 "storage device," viz, a "memory that can store digital information."

e. The Claimed "Assembling . . . Into Either Information Or Instruction Message Units."

The administrative law judge found under claim construction, supra, that claim 7 requires the "storage device" to "take possession or delivery of" or "to take in" the "detected digital information" which may consist of "parts of signal units, whole signal units, or groups of partial or whole signal units or combinations" (emphasis added) (with a "signal unit" being a complete "information or instruction message unit"), and that the claimed "storage device" must also "put or join together" in "an orderly way with logical selection or sequence" the "detected digital information" to form either an "information or

instruction message unit." The administrative law judge interpreted an "instruction message unit" as "something given by way of direction or order" or "information in the form of an outline of procedures: directions" and thus would refer to information actually used to convey commands or instructions. In contrast, an "information message unit" is a reference to data or information that is not an "instruction."

The system described in the Frandon paper has a "memory" that receives teletext data, including a "function code" attached to a "character code" under control of the "CPU." Specifically, the Frandon paper reads:

Fig. 2 — Input Buffer loading.

The CPU (Fig. 3) then sequentially decodes the buffer memory content into a function code (1 byte) attached to a character code (1 byte) which it loads into the page display memory at its screen location address.

* * *

[Fig. 3 omitted]

Fig. 3 — Input data decoding by CPU.

The VDP (Fig. 4) sequentially 1) addresses the page display memory and 2) extracts character code and function. The character code, together with the screen line number, addresses 3) the character generator and 4) extracts one line of the 10 x 10 matrix defined character which is then sent 5), dot by dot, to the RGB amplifiers.

Fig. 4 — Data display.

In summary, data may flow from the prefix processor to the memory, from the memory to the CPU (and return) or from the memory to the display controller. Addressing is provided by the CPU or the VDP time base.

(RX 163 at 335). Accordingly, contrary to complainant's arguments, the administrative law judge finds that the Frandon paper discloses digital data received as individual bytes, and organized on several distinct pages and discloses that the storage device disclosed has the

capacity, under control of the CPU, to assemble these pieces of data and control codes into one complete teletext page. (See RX 163 at 335, Figs. 3, 4). Thus the administrative law judge finds that the Frandon paper discloses assembling digital information into "information . . . message units" as required by claim 7.

f. The Claimed "A Controller . . . Programmed With Information Of The Composition Of Said Signal"

Under claim construction, supra, the administrative law judge found that the "controller" of claim 7 is a programmable device that may have "buffer, microprocessor, ROM, and RAM capacities" (CX 2, '277 patent at col. 22, ln 37-38). Moreover, the specific language of claim 7 requires that the controller be programmed with either information of the "composition" or the "varying location" or the "varying timing pattern" of the specific signal.

The administrative law judge finds that the Frandon paper discloses a "controller" operatively connected to a "storage device" and a "digital detector" as required by claim 7. Thus, the Frandon paper discloses a CPU which is operatively connected to the data slicer and prefix processor, and the memory. As quoted supra, the Frandon paper teaches that the CPU controls the technique used to assemble message units (i.e., a teletext page) in the memory; and that the CPU causes the "digital detector" of the "data slicer" and "prefix processor" to detect, locate, and output the digital signals comprising the teletext page (RX 163 at 334-5).

The administrative law judge finds that the CPU disclosed in the Frandon paper is programmed with information of the composition of the teletext signal (the "specific signal").

The CPU is programmed with the appropriate prefix and framing code of the teletext data.

Specifically, Frandon states:

Prefix and data are entered into a Serial-in/Parallel-out register. The 8 outputs are compared with the framing code coming from the prefix memory which has been preset by the CPU. The coincidence initiates subsequent processing of the packet.

The next bytes, hamming corrected, are compared to the prefix memory to identify the magazine number. Upon coincidence, the format is loaded into a count-down register, a byte clock is generated and data presented to the data bus.

The magazine number, hamming code, maximum value of the format and circuit operation mode are programmable by the CPU. Three types of prefix are available. Data may come out alone or with format and continuity index bytes. Depending on number of packets per field the data are issued either if the prefix only is correct or after an additional selection operated on the data themselves.

(RX 163 at 337). See also, Figs. 9, 10. Accordingly, the administrative law judge finds that the Frandon paper discloses the claim 7 requirement that the controller be "programmed with information of the composition of said signal."

Based on the foregoing, the administrative law judge finds that respondents have established by clear and convincing evidence that the Frandon paper discloses each element of claim 7, and therefore anticipates claim 7 under 35 U.S.C. § 102.

6. Closed Captioning

Respondents argued that "closed captioning" as discussed in PBS, Television Captioning for the Deaf-Signal and Display Specifications, Report No: E-7709-C (May 1980) (RX 225) anticipates claim 7 (BRBr at 68).

Complainant argued that respondents have not established that the PBS document qualifies as prior art because they present no clear and convincing evidence that the public,

by exercising reasonable diligence, could have had access to the PBS document, which appears to be an internal report, citing Northern Telecom, Inc., 908 F.2d at 934-36.

Complainant also argued that closed captioning systems fail to assemble information or instruction message units for use by the receiver apparatus because closed captioning systems simply receive textual information placed into memory, and which flows through the system and is displayed on the television screen in the order received. (CRBr at 33).

The staff argued that, while closed captioning has many of the features of claim 7, there does not appear to be any assembly of digital information into "information or instruction message units." (SBr at 62).

On its face, the PBS document indicates a revision date of May, 1980. However, the document does not, on its face indicate that it was a document intended for publication (RX 225). Moreover, the document at appendix 2 indicates that it is a "PBS Decoder Prototype Manual." Accordingly, the administrative law judge does not find support in the record for respondents' reliance on the fact that any "closed captioning" systems on sale and in use in the U.S. in 1980 were exactly as documented in the PBS document. Moreover, the administrative law judge finds that respondents have failed to present clear and convincing evidence that the PBS document is a "publication" as required by 35 U.S.C. § 102(b). Accordingly, the administrative law judge finds that respondents have failed to present clear and convincing evidence that closed captioning systems anticipate claim 7 in issue.

XIV Respondents Have Failed to Establish That Claim 44 Is Invalid As Anticipated Under 35 U.S.C. § 102 Or Obvious Under 35 U.S.C. § 103

Respondents argued as follows regarding claim 44:

If PMC's interpretation of claim 44 is adopted (where the mass media transmission

and the television transmission are assumed to be the same transmission), then claim 44 is invalid as anticipated by one or more of (a) the UK Teletext system, described for example in the Mullard Teletext publication (RX 180) (N. Williams, Tr 2290:21-2291:9; 2296:10-2304:8) and the Signetics Multitext document (RX 402) (N. Williams, Tr 2580:17-2581:5; 2583:4-8); (b) the Telesoftware system, described, in part, in the Hedger articles (RX 175 and RX 176); (c) the French Antiope system, described in the Frandon article (RX 229); (d) the Universal Teletext Decoders, described in the Marti paper (RX 222) or the Clifford article (RX 223); and (e) closed captioning.

(BRBr at 69) (emphasis added). As detailed under claim construction, supra, and contrary to complainant's interpretation, the administrative law judge found that claim 44 requires a "mass media transmission" and a "television transmission" which are not the same transmission. Accordingly the administrative law judge finds that, under his claim interpretation, none of the cited references anticipate claim 44 in issue, which finding respondents appear to admit to See supra.

Respondents also argued that claim 44 is invalid as obvious in view of work done by the MIT Architecture Machine Group, particularly the Aspen "Movie-Map" system described in the Lippman paper (RX 197), the Mohl paper (RX 258), and the Brown thesis (RX 199, discussing Lippman Fig. 4); and that suggestions to create the invalidating broadcast or cablecast system are found in the Donelson paper (RX 198), the Clay thesis (RX 385), and the Negroponte and Pangaro paper (RX 259) (BRBr at 69).

Complainant and the staff argued that respondents have failed to meet their burden of establishing that claim 44 is obvious in light of the cited references (CRBr at 37-40, SBr at 67-68).

The "Movie-Map" as described in the Lippman paper is essentially a video map that allows a user to simulate driving through a town. The television set displayed the scene that

the driver would see if he or she were actually driving. The user makes navigation choices using either a joystick, or by touching the area of the television screen where certain graphic indicators are located, and depending on where the viewer is going, the graphics will change to indicate the available choices at the next intersection (RX 197 at 32, Bender, Tr at 1950 - 1961). The input of the video information for the Movie-Map, i.e. the map itself, comes from two videodisc players, rather than from either a mass medium transmission or a broadcast or cablecast television transmission (RX-197 at pp. 33-34 and Figures 2 and 4). Thus, as respondents admit, the Movie-Map system fails to disclose at least a "selected broadcast or cablecast television transmission" as required by claim 44. (BRFF 860).

Respondents argued that suggestions to modify the Movie-Map system such that it would receive a selected broadcast or cablecast transmission are found in the Donelson paper (RX 198), the Clay thesis (RX 385), and the Negroponte and Pangaro paper. (RX 259). However, respondents also admit that in substituting a "selected broadcast or cablecast transmission" as required by claim 44 "some, but not all of the capabilities of the system would have to be sacrificed." (BRFF 860). Thus, respondents' Bender testified:

Q Mr. Bender, can you describe for us, perhaps some examples of the functionality of this system as it would be used in a broadcast setting?

A Sure, I'd be happy to do that. First of all, the basic functionality of the system under this configuration is unchanged in that as far as the user is concerned, they're still seeing the overlays. They still have their interaction with the system. It's still responsive.
THE WITNESS:Well, the only difference is that now, instead of having a direct connection between the processor, the video disks and the television set receiver, now all of a sudden we've introduced a broadcast element. And because we've introduced a broadcast element, we've got to make some kind of sacrifice, and that sacrifice is essentially that we've got, instead of a dedicated resource one to one, we've got a resource which is one to many or some to many, and

we've got to figure out how do we engineer that for a solution that's going to be satisfactory. And I can think of, just off the top of my head, five different ways in which we could make a one-to-many solution perform in a way very similar, if not identical to the original Aspen system.

* * *

THE WITNESS: In all the cases in which this broadcast modification is made, nothing at the user end changes, as taught by Lippman, in terms of the interaction, in terms of the overlays.

The only thing that changes is at the broadcast head-end and how quickly the interaction might occur. There are a lot of different ways of slicing up a limited amount of resource. You can time multiplex. You can frequency multiplex. In any case, you can use local storage like is thought with the teletext references. You can do a scheme like movies on demand where you can only jump in at particular time periods but not at a continuous time. You could use a multichannel approach, depending on the number of cable channels you have.

You can service that many people or that many different views of the place. You can have a Q and weight solution or you can have a voting solution as was discussed in my deposition. I'm sure there are many other solutions, but I think that's probably enough for the time being.

(Bender, Tr at 1965-66, 68) (emphasis added). Thereafter, Bender also testified:

JUDGE LUCKERN: Let me ask you this. However, would not some of the capabilities of the particular system as described in these references have to be sacrificed in such a combined system? Do you understand my question?

THE WITNESS: I do understand your question, and I think that probably the answer is yes, not necessarily, but there certainly would be some sacrifice in terms of the degree of interactivity or the latency, but that's inherent when you go from a one-to-one to a many-to-one implementation.

JUDGE LUCKERN: What features, in your opinion, would remain in these combined systems when you combine them? Would some feature still remain in those.

THE WITNESS: One set of features that remain in every instance would be all aspects of the generation of overlays, all aspects of the user reaction and program-driven overlays. All of that would remain. None of it would be

impacted at all. The only thing that would be impacted is the latency associated with your request to go to a particular place at a particular time, and that's only in certain instances of a broadcast version. That's not even necessarily so. It depends on what resources the broadcaster wants to put behind the system.

(Bender, Tr at 2018) (emphasis added). Thus, Bender testified that one feature that would be compromised in converting the Movie Map system for use with a selected broadcast or cablecast transmission is the effectiveness of the individual choice to go to a particular place at a particular time. Id. However, the Lippman paper states that this feature is one of the primary benefits of the Movie Map system. Specifically, Lippman reads as follows:

The manipulation expertise of the television industry can be combined with the modeling and interaction expertise of the computer graphics industry in systems that have the responsiveness and controllability of computer systems, but use the visually complete and detailed imagery of the television world.

* * *

The experience of driving is made more intensive and involving through interaction: the user determines routes, turns, speeds, and points of view. He may also select the season, via a season knob," and the visual mode of the tour: a photo, sketch, or animation (illustration 1). Thus the system does not simply repeat a guided tour, but allows a person to freely explore, at his own rate, via his own path, and with either photographic or detailed computer synthesized visuals.

(RX 197 at 32 - 33). Therefore, the administrative law judge finds that the substitution of a selected broadcast or cablecast transmission would compromise one of the features that motivated the creation of the Movie-Map system. Accordingly, he finds that respondents have failed to establish any motivation to combine the Movie-Map system with a selected broadcast or cablecast transmission, and have thus failed to establish by clear and convincing evidence that claim 44 is obvious under 35 U.S.C. § 103.

XV. Infringement

After the administrative law judge has construed claim language in issue, he must determine whether any accused system falls within the scope of the asserted claims. H.H. Robertson, Co. v. United Steel Deck, Inc., 820 F.2d 384, 389, 2 U.S.P.Q.2d 1926, 1929; Sofamor Danek Group, Inc. v. De Puy-Motech, Inc., 74 F.3d at 1216, 1218, 37 U.S.P.Q.2d 1529, 1531. To find infringement, an accused system must meet each claim limitation, either literally or under the doctrine of equivalents.⁸⁶ Charles Greiner & Co. v. Mari-Med Mfg., Inc., 962 F.2d 1031, 1034, 22 U.S.P.Q.2d 1526, 1528 (Fed. Cir. 1992), Hilton Davis, 117 S.Ct. at 1049, 1054. Complainant has the burden of proving, by a preponderance of the evidence, that the claims in issue are infringed by the accused products. See e.g. Conroy v. Reebok International, Ltd., 14 F.3d 1570, 1573, 29 U.S.P.Q.2d 1373, 1375 (Fed. Cir. 1994); Braun Inc. v. Dynamics Corp., 975 F.2d 815, 24 U.S.P.Q.2d 1121 (Fed. Cir. 1992); 4 Chisum, Patents, § 18.06[1] (1995).

A. Complainant Has Failed to Establish That Users of the Accused DSS Receivers Directly Infringe Claim 6

Complainant argued that users of Thomson, HNS, Toshiba, Hitachi and Matsushita DSS receivers (the accused DSS receivers) directly infringe claim 6 of the '277 patent (CBr at 33). Each of respondents and the staff argued that users of the accused DSS receivers do not infringe claim 6 (BRBr at 105, SBr at 91).

Based on the administrative law judge's review of the record, the administrative law judge finds that complainant has failed to establish that users of the accused DSS receivers

⁸⁶ At closing arguments, complainant's counsel represented that complainant is not alleging infringement under the doctrine of equivalents (Tr at 3681).

directly infringe claim 6 of the '277 patent. Specifically, the administrative law judge finds that complainant has not established that the accused DSS receivers incorporate a "digital detector for receiving said [television program] transmission and detecting said predetermined signal in said [television program] transmission based on either a specific location or a specific time."

In determining if an accused device infringes a claim in means-plus-function format, the administrative law judge must determine if the accused device contains the structural equivalent of the element as disclosed in the patent specification. Thus, the Federal Circuit has held that:

[I]literal infringement of a claim containing a means clause requires that the accused device perform the identical function as that identified in the means clause and do so with structure which is the same as or equivalent to that disclosed in the specification.

Micro Chemical Inc. v. Great Plains Chemical Co., 103 F.3d 1538, 1547, 41 U.S.P.Q.2d 1238, 1245 - 1246 (Fed. Cir. 1997), citing Valmont Indus., Inc. v. Reinke Mfg. Co., 983 F.2d 1039, 1042, 25 U.S.P.Q.2d 1451, 1454 (Fed. Cir. 1993). As explained in detail under "indefiniteness" supra, the administrative law judge does not find any structural recitation in the specification, as required under 35 U.S.C. § 112, sixth paragraph, and is therefore unable to define the claim phrase "digital detector" in relation to the "equivalent" of any structure disclosed in the '277 specification. Id. Accordingly, the administrative law judge is only able to determine whether the accused device has some structure that accomplishes the function of "receiving said [television program] transmission and detecting said predetermined signal in said [television program] transmission based on either a specific location or a specific time."

Complainant argued that the “digital detector element of claim 6 is implemented in both the Thomson and HNS receivers{

}(CRBr at 52).

Respondents argued that “it is impossible to conclusively determine whether the DSS system contains a ‘digital detector.’ Nevertheless, assuming that a digital detector is a device which detects digital information embedded in an analog television transmission, . . . then the DSS system does not have such a device.” (BRBr at 106). Respondents also argued that the ‘277 specification “does clearly state that a signal’s ‘location’ within a transmission may refer to the audio or video portion, to the scan line, or to the place in the audio range. [citation omitted]. It nowhere, however, employs ‘location’ in a transmission to refer to a signal’s carrier frequency.” (BRRBr at 9-10).

As the administrative law judge found under claim construction, supra, the phrase “digital detector” is a functional phrase, directed to a “means for receiving said [television program] transmission and detecting said predetermined signal in said [television program] transmission based on either a specific location or a specific time.” The administrative law judge also found that “location” as the word is used in claim 6 would include a line, or lines, or portions of a line in the vertical interval of a television video transmission, or a frequency

within the audio range of a television transmission. However, he finds that "location" or "varying location" as used in claim 6 of the '277 patent does not include a change in "carrier frequency."

The DSS system broadcasts on 32 separate frequencies, each frequency being relayed by a transponder on a satellite, with DIRECTV operating on 27 frequencies, and USSB operating on 5. (FF 452, 453). Each transponder frequency consists of an analog carrier with digital data modulated onto it (R. Williams, Tr at 525-526). The DSS transmission consists of{

}

{

} The '277 specification contains

a description of the content of SPAM signals, including header information of SPAM signals.

In addition, claim 7 requires a controller programmed with "information of the composition of said signal or with either the varying location or the varying timing pattern of said signal." (FF 18). This language of claim 7 shows that the composition of a signal,{

} is not the "location" of that signal

within the meaning of claim 6. Moreover, the '277 patent specification teaches:

FIG. 2E shows one example of the composition of signal information (excluding bit information required for error detection and correction). The information in FIG. 2E commences with a header which is particular binary information that synchronizes all subscriber station apparatus in the analysis of the information pattern that follows.

(CX 2, '277 patent at col. 26, lns. 37-47). (emphasis added) Thus, the specification teaches that "header" information is "the composition of signal information" not location. {

}

A In the patent, as is made clear by figure 2A and the description of figure 2A in the specification, the digital detector receives baseband video signal. It does not receive a carrier signal, and in this diagram that you have, which is RX 353 --

Q Why don't you make a reference to CX 62, because that's what my question was addressed to.

{

}

Q Taken together constitute the circuitry for extracting the digital signal from the analog carrier that brings it into the IRD.

A Well, sure. These three elements taken together extract digital information from the satellite signal that's been modified slightly by the low noise blocking and all that. But that's a carrier signal, and if you want to call that a digital detector, that's okay with me, but it's not the digital detector that's in the claim or in the patent.

(Schreiber, Tr at 1612-1613).

Based on the foregoing, the administrative law judge finds that complainant has failed to establish that the accused DSS receivers identify a "predetermined signal" "based on . . . a specific location." Accordingly, complainant has failed to establish that users of the accused DSS systems infringe claim 6.⁸⁷

B. Complainant Has Failed to Establish That Users of the Accused DSS Receivers Directly Infringe Claim 7

Complainant argued that users of Thomson, HNS, Toshiba, Hitachi and Matsushita DSS receivers (the accused DSS receivers) directly infringe claim 7 of the '277 patent (CBr

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(CRFF 677, citing CX 45, at 11, § 3.7). The administrative law judge finds that this extrinsic evidence on the meaning of the word "location" is in direct conflict to the intrinsic evidence from the '277 specification and other claims of the '277 patent, which demonstrate that "location" in claim 6 is not a reference to the content of a given "predetermined signal."

at 45). Each of respondents and the staff argued that users of the accused DSS receivers do not infringe claim 7. (BRBr at 109, SBr at 92).

Based on his review of the record, the administrative law judge finds that complainant has failed to establish that users of the accused DSS receivers directly infringe claim 7 of the '277 patent. Specifically, the administrative law judge finds that complainant has not established that the accused DSS receivers incorporate a "digital detector for receiving at least some information of said [television program] transmission and detecting said specific signal at a specific location or a specific time."

As detailed, supra with respect to claim 6, the administrative law judge is unable to define the claim phrase "digital detector" in relation to any "equivalent" structure disclosed in the '277 specification. Id. Accordingly, the administrative law judge is only able to determine if the accused device has some structure that accomplishes the function of "receiving at least some information of said [television program] transmission and detecting said specific signal at a specific location or a specific time."

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} Accordingly, the administrative law judge finds that complainant has failed to establish that the accused DSS receivers infringe claim 7, because the accused DSS system does not have a "digital detector" that is for "detecting said specific signal at a specific location or a specific time" as required by claim 7.

C. Complainant Has Failed to Establish That Users of the Accused DSS Receivers Directly Infringe Claim 44

Complainant argued that claim 44 only requires a television receiver that is capable of receiving a "point-to-multi-point" transmission, and that no such transmission is actually required. (CRBr at 55). Complainant also argued that a user of the accused DSS system may be tuned to a pay-per-view channel on which the DBS broadcast is intended to solicit the viewer to buy the program by displaying film clips from the movie as well as discussions with the directors and actors; that, if the viewer presses the appropriate button on the keypad of the remote control, indicating that the user wants more information about the program, the processor in the DSS receivers will generate an overlay displaying additional information about the program such as the start time, title, and rating of the program; that the DSS receivers display video overlays related to "the television program" such as an information banner, which includes information such as the title and rating of the television program; and that the DSS receivers display the Program Guide, which is a video overlay displaying information such as the title and rating of the television program and is generated in response to the viewer pressing the appropriate button on the remote control. (CBr at 57-58, 61).

Respondents argued that the plain language of claim 44 requires two transmissions: "a broadcast or cablecast transmission," which is received by a "television receiver," and a "mass medium transmission," which is received by a "mass-medium receiver;" that the digital detector detects digital information through its connection to the mass medium receiver; that the DSS system, however, has only one "receiver" — the IRD — and one transmission, from the satellites. (BRBr at 110-111).

The staff argued that the pay-per-view screen is a locally generated overlay related to a viewer reaction to specific television program content; that, if claim 44 is found to be valid, it is infringed by the use of this overlay; that the DSS receivers only satisfy claim 44 if the administrative law judge adopts complainant's claim construction wherein the television receiver need only be capable of receiving a broadcast or cablecast television transmission; and that televisions connected to DSS receivers that are actually showing programming provided to the television from the receiver are not also actually receiving separate broadcast or cablecast television programming. (SBr 95-96).

The administrative law judge finds, based on the record, that the accused DSS system does not have the capabilities required by claim 44. Specifically, the DSS system does not have the capacity to generating and outputting information of a video overlay that is related to "said television programming" or "said reaction information" as required by claim 44.

As detailed under claim construction, supra, the "television receiver system" of claim 44 must be capable of receiving a "television transmission" and transferring "television programming" from said transmission to a "television display." Complainant has identified the "receiver portion" and "display portion" of an "ordinary television set" as meeting this claim requirement (CRBr at 55).⁸⁸ However, it is undisputed that when the DSS system is in

⁸⁸ Complainant's expert Williams admitted that the "receiver" element in the accused DSS System serves no purpose, and that the DSS Systems is capable of operation if a "monitor without a TV receiver component" is used. Thus, Williams testified:

Q Dr. Williams, is the DSS receiver capable of being operable when hooked up only to a TV display device without a TV receiver?

A I believe that it would be possible to connect an IRD directly to a television display device because it does send out that baseband, the NTSC. You wouldn't have to have, necessarily, the other components, other than a monitor of some sort on

use, i.e. receiving a "mass-medium transmission" and generating a "video overlay," the "receiver portion" of the "ordinary television set" is not capable of receiving a "television transmission," and therefore can not transfer "television programming" from said transmission to the "display portion" of the "ordinary television set." Thus, complainant's expert Williams testified regarding the operation of the DSS system:

Q You understand, don't you, Doctor, that in the DSS system, a viewer is only able to see either the locally broadcast television programming or the programming that's transmitted through the DSS system, but can't mix both together; right?

A I understand it's possible to switch back and forth between the two, but you only watch one at a time, if that's what you're asking.

display.

* * *

Q That display device could be a monitor without a TV receiver component?

A If it were a monitor that were capable of receiving that NTSC baseband that comes as one of the options out of the IRD.

Q Well, Doctor, if the display device did not have a TV receiver along with it, would the DSS system, as configured in that scenario, come within the scope of claim 44?

A Well, I believe the first element of claim 44 requires a television receiver. If there is not a television receiver, then I would expect the answer to that would be no.

Q And for example, the monitors that we see around this room here don't have TV receivers associated with them; correct?

A I don't think they do. I haven't examined them, but I don't think they do.

Q Assuming they don't have TV receivers, each one of these hookups which forms part of a DSS system would not be within the scope of claim 44; is that right?

A If there's not a receiver, the television receiver is an element of claim 44.

(Williams, Tr at 851-852). (emphasis added).

(Williams, Tr at 852).

Complainant has argued that three types of “overlays” are generated by the accused DSS systems, that “information concerning [a pay-per-view] movie . . . such as the start time, rating, and time” is a “video overlay” related to “a viewer’s reaction to specific content in that program;” and that “an information banner, which includes information such as the title and rating of the television program” is a video overlay related to “said television programming;” and that “the Program Guide . . . is a video overlay displaying information . . . in response to the viewer pressing the appropriate button on the remote control.” (CBr at 61). However, contrary to complainant’s argument, the “television display” is not displaying said “television programming,” as that phrase is used in claim 44, because the “television receiver” is not actually receiving a “television transmission.” Accordingly, because there is no “television programming”, resulting from a “television transmission” in the accused DSS system⁸⁹ the administrative law judge finds that it is impossible for the “processor” of the accused system to generate an “overlay that is related to said television programming.” Similarly, there is no “specific television program content,” as that phrase is used in claim 44, to which the viewer can react, because the “television display” is not displaying “television programming” as that phrase is used in claim 44. Moreover, there is no “television programming” which the “video overlay” can be placed on top of. As complainant’s expert Davis testified “it doesn’t make any sense to have an overlay if you can’t overlay it on the programming.” (Davis, Tr at 3437).

⁸⁹ It is undisputed that the DSS system does display “television programming” in the generic sense (BRCFF 449A). However, claim 44 is directed to television programming “in said [broadcast or cablecast] transmission” and not to television programming in “a mass medium transmission.”

Based on the foregoing, the administrative law judge finds that complainant has failed to establish that the accused DSS system is a "television receiver system" as claimed in claim 44 in issue.

XVI Contributory Infringement

Complainant argued that respondents DIRECTV and USSB contributorily infringe claims 6 and 7 of the '277 Patent (CBr at 40, 49).

Under 35 U.S.C. § 271(c):

Whoever offers to sell or sells within the United States or imports into the United States a component of a patented machine, manufacture, combination or composition, or a material or apparatus for use in practicing a patented process, constituting a material part of the invention, knowing the same to be especially made or especially adapted for use in an infringement of such patent, and not a staple article or commodity of commerce suitable for substantial noninfringing use, shall be liable as a contributory infringer.

19 U.S.C.A. § 271(c) (1996 Supp.), See Dawson Chemical Co. v. Rohm & Haas Co., 448 U.S. 176 (1980). Contributory infringement cannot be successfully asserted without a showing of direct infringement. Porter v. Farmer's Supply Serv., Inc., 790 F.2d 882 (Fed. Cir. 1986) (Porter); see also Hardware, Unreviewed Initial Determination at 160-161.

The administrative law judge has found, supra, that complainant has failed to establish direct infringement of claims 6 and 7 in issue. Accordingly, because there has been no showing of direct infringement, the administrative law judge finds that complainant cannot successfully assert that respondents DIRECTV and USSB contributorily infringe claims 6 and 7 of the '277 patent.

XVII Induced Infringement

Complainant argued that DIRECTV and USSB induce infringement of claims 6, 7, and 44 of the '277 patent (CBr at 62).

Section 271(b) of the patent statute provides that one who "actively induces infringement of a patent shall be liable as an infringer." 35 U.S.C. § 271(b). The Commission has found that induced infringement is established when a party shows (1) the conduct being induced constitutes direct infringement, (2) the respondent actively and knowingly aided and abetted another's direct infringement of the patent, and (3) the accused infringer knew or should have known that his actions would induce infringement. *Flash Memory*, at 16, citing Manville Sales Corp. v. Paramount Sys. Inc., 917 F.2d 544, 553 (Fed. Cir. 1990). See also Hardware, *supra*, at 178; Certain Headboxes and Papermaking Machine Forming Sections for the Continuous Production of Paper, and Components Thereof, Inv. No. 337-TA-82, USITC Pub. No. 1138 at 18-19 (1981).

The administrative law judge has found, *supra*, that complainant has failed to establish direct infringement of claims 6, 7 and 44 in issue. Accordingly, because there has been no showing of direct infringement, the administrative law judge finds that complainant cannot successfully assert that respondents DIRECTV and USSB induce infringement of claims 6, 7 and 44 of the '277 patent.

XVIII Remedy

Pursuant to 19 U.S.C. § 1337(d) (1994), complainant requested issuance of a limited exclusion order against respondents TCE, HNS, Hitachi, Toshiba, Matsushita and DIRECTV, their affiliated companies, parents, subsidiaries, or other related entities with

respect to all models of DSS receivers imported, sold for importation, or sold after importation into the United States that are covered by claims 6, 7 and/or 44 of the '277 patent. (CBr at 122).

Pursuant to 19 U.S.C. § 1337(f) (1994), complainant also requested cease and desist orders against respondents TCE, Matsushita, Toshiba, HNS, Hitachi and DIRECTV, directing them to cease importing, selling, marketing, advertising, distributing, offering for sale, transferring, and soliciting U.S. agents or distributors for DSS receivers "covered by the claims" of the '277 patent. (CBr at 122).

Complainant further requested that the Commission issue cease and desist orders against DIRECTV and USSB (1) directing them to de-authorize or de-activate accused DSS receivers so that such receivers cannot receive respondents' broadcast signals, which activity complainant alleged constitutes a contributory infringement of the '277 patent and (2) prohibiting them from selling, advertising, or offering for sale their broadcast signal in connection with any accused DSS receivers, including future authorizations of any such DSS receivers. Complainant represented that those cease and desist orders would not affect the broadcast of signals to DSS receivers that are licensed or non-infringing, e.g., DSS receivers manufactured by Sony. (CBr at 124). See also Tr at 3785, 3786.

The staff argued that the appropriate remedies, in the event a violation is found, would be: (1) a limited exclusion order as to infringing DSS receivers imported by or on behalf of respondents TCE, HNS, Hitachi, Toshiba, and Matsushita; and (2) cease and desist orders directed to TCE, HNS, Hitachi, Toshiba, Matsushita, DIRECTV, and USSB prohibiting importations and sales after importation of infringing DSS receivers and related

infringing activities. To the extent that complainant is seeking cease and desist orders requiring DIRECTV and USSB to cease authorizing the receipt of signals by customers who have already purchased imported DSS receivers from non-licensed sources, the staff argued that such relief is inconsistent with the Commission's practice of providing prospective relief as to future imports and not imposing costly burdens on innocent domestic purchasers of accused articles that have already been imported; and that if exclusion and cease and desist orders are in place for future imports and sales, the additional step of ordering DIRECTV and USSB to stop authorizing the receipt of signals by *new* purchasers of the subject DSS receivers is unnecessary, since the flow of imports should cease. Accordingly, the staff argued that in those circumstances, the Commission's remedy should not extend to prohibit any broadcast transmissions. (SBR at 101-102).

The broadcasting respondents also argued that, given the mandatory nature of 19 U.S.C. § 1337(d), if the broadcasting respondents are found to have violated section 337 and the Commission determines that the public interest does not preclude an exclusion order, a limited exclusion order prohibiting respondents from importing DSS receivers into the United States would be an appropriate remedy.

The broadcasting respondents argued that in contrast to the mandatory issuance of exclusion orders under subsection (d) of section 337, issuance of cease and desist orders under subsection (f) is discretionary even if section 337 is violated and because complainant does not manufacture or sell DSS receivers, complainant's requested cease and desist order prohibiting them from importing, selling, marketing, advertising, distributing, and offering for sale imported DSS receivers and/or components of them would not prevent injury to

complainant and that cease and desist orders are therefore inappropriate. However, if the broadcasting respondents are found to have violated section 337 and the Commission believes that the policy behind issuing a cease and desist order would be served, it is the position of the broadcasting respondents that the only cease and desist order consistent with Commission precedent would be an order prohibiting the importation and sale after importation of DSS receivers found to have violated the '277 patent. (BRBr at 132).

Based on the evidence of record, the administrative law judge finds that accused DSS receivers manufactured abroad by respondents HNS are sold in the United States under the Hughes, Memorex, and Hitachi brand names (FF 412, 413). He also finds that the accused DSS receivers manufactured abroad by respondent TCE are sold in the United States under the RCA, GE, ProScan, Toshiba, and Panasonic (on behalf of respondent Matsushita) brand names (FF 415, 418). As detailed supra, the administrative law judge has found no violation of section 337 by respondents, based in part on his finding that the accused DSS systems do not infringe any of the asserted claims of the '277 patent. If the Commission determines that the accused DSS receivers manufactured by HNS and TCE infringe one or more of the asserted claims of the '277 patent, and that one or more of the asserted claims are valid, the administrative law judge recommends that a limited exclusion order should issue covering all models of DSS receivers manufactured, imported, and sold in the United States by the manufacturing respondents.

Under section 337(f)(1), the Commission has the authority to issue cease and desist orders. Specifically, that section provides:

In addition to, or in lieu of, taking action under subsection (d) or (e) of this section, the Commission may issue and cause to be served on any person violating this

section, as the case may be, an order directing such person to cease and desist from engaging in the unfair methods or acts involved. . . .

19 U.S.C. § 1337(f)(1).

The Commission will issue a cease and desist order where a "commercially significant inventory," of accused products exists. See e.g. Hardware, supra at 195. The administrative law judge finds that each of the respondents in this investigation that manufacture and sell accused DSS receivers has substantial inventories of such receivers in the United States (at the estimated retail value of at least \$199 each) (FF 630). {

} Accordingly, should the Commission determine that the accused DSS receivers manufactured by HNS and TCE infringe one or more of the claims in issue of the '277 patent, and that one or more of the asserted claims are valid, the administrative law judge recommends, in view of said inventories of accused DSS receivers, the issuance of cease and desist orders against TCE, HNS, Hitachi, Toshiba, Matsushita, DIRECTV and USSB to the extent only that the orders prohibit importation of accused DSS receivers and the sale after importation of imported accused DSS receivers. He rejects complainant's arguments to the effect that any cease and desist order should require DIRECTV and USSB to de-authorize or de-activate certain DSS receivers, since he finds that such would impose costly burdens on

innocent domestic purchasers of said receivers and, as the staff has argued, would not be necessary to provide complainant with complete relief.

XIX Bond

Complainant argued that, pursuant to 19 U.S.C. § 1337(j)(3), the Commission must determine the rate of any bond that respondents HNS, Thomson, Hitachi, Matsushita, Toshiba, and DIRECTV must post to continue importation and domestic sale of accused DSS receivers during the Presidential review period; that a significant consideration in determining the amount of the bond is the protection of the domestic industry from harm, citing Commission rule 210.50(a)(3); that in this investigation, complainant and its licensees are entitled to be free from the continued harm of additional sales of respondents' unlicensed and infringing DSS receivers. Accordingly, complainant requested that the Commission impose a 100% bond during the Presidential review period. (CBr at 131).

The staff argued that complainant does not produce any product under the '277 patent, and there is no detailed evidence regarding domestic production by a licensee of complainant. Hence, the staff argued that protecting the domestic industry against harm is more properly accomplished by reference to complainant's loss of licensing income; and that the bond should be based upon a reasonable royalty rate. (SBr at 103).

The broadcasting respondents argued that, while it is their position that no bond should be required, they believe that at most the bond should be fixed at { } a receiver, the royalty that complainant currently charges Sony, which is licensed with respect to all of complainant's issued patents and pending applications. (BRBr at 138).

During the period of Presidential review of a Commission determination on permanent relief finding a violation of section 337, respondents are entitled to import the articles subject to any exclusion order or cease and desist order under a bond "sufficient to protect the complainant from any injury." 19 U.S.C. § 1337(j)(3); 19 C.F.R. § 210.50. The Commission "typically has considered the differential in sales price between the patented product made by the domestic industry and the lower price of the infringing imported product, and has set a bond amount sufficient to eliminate that difference." Certain Microsphere Adhesives, Process for Making Same, and Products Containing Same, Including Self-Stick Repositionable Notes, Inv. No. 337-TA-366, Comm'n Op. at 24 (Jan. 16, 1996). In this investigation, complainant does not manufacture any product, and thus no price comparison is possible (FF 160). However, complainant's licensee Sony does sell products in competition with the accused receivers manufactured by respondents TCE and HNS (FF 641). The administrative law judge finds that a bond in the amount of the royalty paid by Sony would eliminate any cost difference between accused and licenced DSS receivers, and is therefore sufficient to protect the complainant from any injury during presidential review. See e.g. Acid-Washed Denim Garments & Accessories, Inv. No. 337-TA-324, Comm'n Op. at 27-28 (1992), Plastic Encapsulated Integrated Circuits, Inv. No. 337-TA-315, Comm'n Op. at 45-46 (1992). Accordingly, the administrative law judge recommends a bond of { } per accused receiver, which is equal to the royalty that complainant currently charges Sony, (FF 647).

FINDINGS OF FACT

A. The Parties

1. Complainant Personalized Media Communications, L.L.C. (PMC) is a limited liability company formed under the laws of the State of Delaware with its principal place of business at 110 East 42nd Street, Suite 1704, New York, NY 10017. (CX 395, at ¶1).

2. PMC was formed in September, 1995 and, in December, 1995, acquired most of the assets and certain liabilities of Personalized Mass Media Corporation (PMMC). (McCandless, CX 7, at 2, Q6; CX 395, at ¶2).

3. PMC's predecessor company, National Cable Clearinghouse, was founded in 1981 by Mr. Harvey. Its name was changed to PMMC in 1989. PMMC's assets were sold to PMC in 1995. (Metzger, Tr at 172-73).

4. Respondent Hughes Network Systems (HNS) is a corporation organized and existing under the laws of the State of Delaware with its principal place of business at 1171 Exploration Lane, Germantown, MD 20876. (CX 395, at ¶3).

5. HNS is in the business of designing, manufacturing, importing and selling in the United States consumer electronics products. (CX 395, at ¶4).

6. Respondent Hitachi Home Electronics (America), Inc. (Hitachi) is a corporation organized and existing under the laws of the State of California with its principal place of business at 3890 Steve Reynolds Blvd., Norcross, GA 30093. (CX 395, at ¶5).

7. Hitachi is in the business of designing, manufacturing, importing and selling in the United States consumer electronics products. (CX 395, at ¶6).

8. Respondent DIRECTV is a corporation organized and existing under the laws

of the State of California with its principal place of business at 2230 E. Imperial Highway, El Segundo, CA 90245. (CX 395, at ¶9).

9. DIRECTV is in the business of selling and providing television programming through the transmission of satellite broadcast signals. (CX 395, at ¶10).

10. Respondent USSB is a corporation organized and existing under the laws of the State of Minnesota with its principal place of business at 3415 University Avenue, St. Paul, MN 55114. (CX 395, at ¶11).

11. USSB is in the business of selling and providing television programming through the transmission of satellite broadcast signals. (CX 395, at ¶12).

12. Respondent Thomson Consumer Electronics, Inc. (Thomson or TCE) is a corporation organized and existing under the laws of the State of Delaware with its principal place of business at 10330 N. Meridian Street, Indianapolis, IN 46290-1024. (RX 1713, at ¶6).

13. Thomson is engaged in the business of designing, manufacturing, importing, and selling in the United States consumer electronics products. (RX 1713, at ¶7).

14. Respondent Toshiba America Consumer Products Inc. (Toshiba) is a corporation organized and existing under the laws of the State of New Jersey with its principal place of business at 82 Totowa Road, Wayne, NJ 07470. (RX 1713, at ¶8).

15. Respondent Matsushita Electronic Corporation of America (Matsushita) is a corporation organized and existing under the laws of the State of Delaware with its principal place of business at One Panasonic Way, Secaucus, NJ 07094. (RX 1713, at ¶10).

B. The '277 Patent And Claims In Issue

16. United States Patent 5,335,277 (the '277 patent) in issue and entitled "Signal Processing Apparatus and Methods," was issued on August 2, 1994. The named inventors are John C. Harvey and James W. Cuddihy. In issue are claims 6, 7 and 44 of the '277 patent. (RX 106).

17. Claim 6 of the '277 patent states in its entirety:

A system for identifying a predetermined signal in a television program transmission in which a plurality of signal types are transmitted said signal being transmitted in a varying location or a varying timing pattern, said television program transmission being separately defined from standard analog video and audio television, said system comprising:

a digital detector for receiving said transmission and detecting said predetermined signal in said transmission based on either a specific location or a specific time; and

a controller operatively connected to said detector for causing said detector to detect said predetermined signal based on either a specific location or time, said controller being programmed with either the varying locations or the varying timing pattern of said signal.

(CX 2, col. 312, ll. 29-45).

18. Claim 7 of the '277 patent states in its entirety:

A system for locating or identifying a specific signal in a television program transmission that contains digital information and for assembling information contained in said specific signal, said transmission being separately defined from standard analog video and audio television, said system comprising:

- a digital detector for receiving at least some information of said transmission and detecting said specific signal at a specific location or time;
- a storage device operatively connected to said digital detector for receiving detected digital information of said specific signal and assembling at least some of said digital information into either information or instruction message units; and
- a controller operatively connected to said detector and said storage device for causing said detector to locate, detect or output said signal and for controlling a technique used by said storage device to assemble message units, said controller being programmed with information of the composition of said signal or with either the varying location or the varying timing pattern of said signal.

(CX 2, col. 312, ll. 46-67).

19. Claim 44 of the '277 patent states in its entirety:

A television receiver system comprising:

- a television receiver for receiving a selected broadcast or cablecast television transmission and transferring television programming in said transmission to a television display;
- an input device for inputting information of the reaction of a viewer to specific television program content;
- a digital detector operatively connected to a mass medium receiver for detecting digital information in a mass medium transmission and transferring some of said detected information to a processor; and
- a processor operatively connected to said detector and said input device for generating and outputting information of a video overlay that is related to said television programming or said reaction information; and

a television display device operatively connected to said processor for receiving and displaying said video overlay.

(CX 2, col. 323, ll. 32-52).

20. The '277 patent was originally assigned to PMMC. (CX 2).

C. Patents And Patent Applications Of Harvey And Cuddihy As Co-Inventors

21. PMMC is the named assignee on six issued United States patents naming John C. Harvey and James W. Cuddihy as co-inventors:

Patent No.	Application Serial No.	Filing Date	Issue Date
4,694,490 (‘490 patent)	317,510 (‘510 application)	Nov. 3, 1981	Sept. 15, 1987
4,704,725 (‘725 patent)	829,531 (‘531 application)	Feb. 14, 1986	Nov. 3, 1987
4,965,825 (‘825 patent)	96,096 (continuation-in-part ‘096 application)	Sept. 11, 1987	Oct. 23, 1990
5,109,414 (‘414 patent)	588,126 (‘126 application)	Sept. 25, 1990	Apr. 28, 1992
5,233,654 (‘654 patent)	849,226 (‘226 application)	Mar. 10, 1992	Aug. 3, 1993
5,335,277 (‘277 patent)	56,501 (‘501 application)	May 3, 1993	Aug. 2, 1994

(RX 101 at 1, RX 102 at 1, RX 103 at 1, RX 103A at 1, RX 104 at 1, RX 105 at 1, RX 106 at 1).

22. The ‘501 application, on which the ‘277 patent issued, is a continuation

application of the '226 application which is now the '654 patent. The '226 application is a continuation of the '126 application which is now the '414 patent. The '126 application is a continuation of the '096 application filed September 11, 1987, which is now the '825 patent. The '096 application is a continuation-in-part application of the '531 application which is now the '725 patent. The '531 application is a continuation of the '510 application which is now the '490 patent. (CX 2).

23. The specifications for the '490 and '725 patents were identical and 22 patent columns in length (RX 101, RX 102). The specification for the '096 application, in contrast, was approximately 322 patent columns in length. (RX 103).

24. The Patent and Trademark Office (PTO) issued a Notice of Allowance for one additional patent subsequent to the issuance of the '277 patent, but that Notice of Allowance was withdrawn by the PTO and the application (Serial No. 397,582) is still under examination. (Scott Tr at 2820).

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26. The '510 application was the parent application for each of the '490 patent, the '725 patent, the '825 patent, the '414 patent, the '654 patent and the '277 patent. (CX 2).

27. Thomas J. Scott is the attorney of record for Messrs. Harvey and Cuddihy in all Harvey/Cuddihy applications pending as of July 1997. (Scott Tr at 2802).

28. Scott was attorney of record for the inventors in the '126 application, '226 application and '501 application from which the '414 patent, the '654 patent and the '277 patent issued respectively. (Scott Tr at 2802).

29. Some two hundred fifty (250) references, which were disclosed to the Examiner by the named inventors, are cited on the first four pages of the '277 patent. (CX 2).

30. Scott as to the citation of some 250 references testified:

Q Do you have any reason why there were 250 different references cited in the '277 patent?

A In the '277 patent that was filed, there were three claims and in July of the year in which it was filed, I believe there were another 53 claims added. Those claims addressed a wide variety of subject matters and were addressed to a number of individual features of Mr. Harvey's multiple inventions disclosed in the application that led to the '277 patent.

Because of the wide variety of claim subject matter, it was appropriate to search all the references that we knew of at the time and make a determination of the ones that were relevant to each one of the claims. And when we did that, the result was 257 or however many there were.

Q Did you give thought to how that number of references might impact the normal operating procedures in the Patent Office when you submitted that many patents?

A I don't think it's uncommon to submit a large number of references when there is a variety of claim subject matter. The Patent Office charges you a fee for the number of independent claims that you submit based on the expense involved in the examination of those, and the fee was paid and PMC was entitled to the appropriate examination that the government gives as a result of the payment of that fee.

Q Did you give any thought to the consequences that number of patents would have on the quality of examination that the application would receive?

A Absolutely.

Q And what was the thought that you gave?

A That it would improve the examination for the examiner to have every material reference that we knew of. The whole purpose of Rule 56 is to improve the quality of the examination.

Q In connection with the submission of references, did you make an effort to eliminate duplicate references?

A My recollection is that -- and you must remember, this was done as a collaborative effort. It was done, in part, by Mr. Harvey, in part by me, in part by those operating under my supervision at Howrey & Simon, and there were some errors made in this submission and in subsequent documents we attempted to correct those errors.

Q Isn't it a fact that 12 references cited to the Patent Office in the '277 patent were cited on more than one occasion in the same prosecution?

* * *

A Are you suggesting that the same number appeared in two of the disclosure statements again?

Q Yes?

A I don't know whether that occurred or not. Again, the documents are of record in the case and comparisons can be made. I don't know the answer to that question.

Q Did you make any effort to delete duplicates?

A As I said before, there were some errors made in the submissions and we made an attempt to correct those and that's discussed in the information disclosure statements.

Q Did you make any effort to reduce the number of references by eliminating patents that had substantially the same disclosures as other patents?

A What we did, sir, was to go through the patents and determine the ones that we considered material to the claims under the then existing rules and cite the ones that met the materiality requirement in Rule 56.

Q Do you have an explanation -- let me ask, in your experience do you often file patent applications having in excess of 500 pages in the specification?

A Absolutely.

Q And in your experience, do you often file patent applications that have 250 cited references prior to the issuance of the case?

A I'm trying to think -- I do an awful lot of computer software work, and as you're well aware, those applications are often much longer than some others because of the detail that must be provided. And I cite the references that I know of that I consider material to all of the claims in those cases.

Q Is it typical the number of references are in the neighborhood of 250 references or greater, in your experience?

* * *

THE WITNESS: The problem is that no invention is the same and no claim is the same. So what you do is you do what's appropriate in each case. And yes, I've filed patent applications and software inventions that have been hundreds of pages and if I have a large number of references, I cite them, so what I do is appropriate. And I use the word "typical" is inappropriate.

* * *

Q In connection to the references that were cited, the 250 references, do you make a comparison between each of the references in each of the claims prior to citing them to the Patent Office?

A Either I, Mr. Harvey or those under my supervision made such a comparison, yes.

Q Were any references cited that, in your opinion, directly anticipated -- in your opinion at the time of citation, directly anticipated claims in the case?

A Absolutely not.

(Scott Tr at 2865-2870).

D. Initial Conception Of Inventions In Issue

31. John C. Harvey and James W. Cuddihy, inventors on the '277 patent, began their business association in 1981. (RX 123, Harvey Dep. at 69).

32. Cuddihy believed that the first entry in Harvey's notebook relating to any discussions between him and Cuddihy on the subject of an invention was in April of 1981. (Cuddihy Tr at 718).

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36. From the period April 1981 to November 1981, Scott did not observe any testing of any physical prototype or bread-board device related to the inventions in issue. (RX 129, Scott Dep. at 731).

37. Harvey did the majority of the initial drafting of the text of the '490 patent application. (Cuddihy Tr at 723, Harvey Tr at 1037-1038).

38. Cuddihy did the majority of the initial technical drawings for the '490 patent application. (Cuddihy Tr at 722).

39. One of Cuddihy's primary contributions to the 1981 application was the drawings that eventually led to the figures in the '490 patent. (Cuddihy Tr at 774).

40. During the course of preparing the 1981 '510 application, Cuddihy did not envision any particular circuitry that would be used to implement the functional blocks set forth in the diagrams prepared for that application. (Cuddihy Tr at 774).

41. During the course of preparing the 1981 '510 application, Cuddihy did not envision any particular circuitry which would be used to implement the functionality of boxes marked as "Digital Detector" in the diagrams of that application. (Cuddihy Tr at 774-775).

42. During the course of preparing the 1981 '510 application, Cuddihy and Harvey did not discuss with each other what circuits could be utilized to implement the functionality of a digital detector. (Cuddihy Tr at 775).

43. During Cuddihy's career as an electrical engineer, he had never designed a digital detector similar to those set forth in the figures of the '490 patent. (Cuddihy Tr at 775).

44. Cuddihy agreed that the drawings that eventually led to the figures in the '490 patent are essentially functional block diagrams of the systems described in the '490 patent. (Cuddihy Tr at 774).

45. Cuddihy has never made any detailed drawings of the circuitry that can be used to implement the devices shown as functional blocks in the '490 patent. (Cuddihy Tr at 774).

46. Harvey's undergraduate degree from Yale University is in history. (Harvey Tr at 1029).

47. While at Yale, Harvey took some courses in naval sciences. (Harvey Tr at 1030).

48. In 1966, Harvey attended a ten week course at the Navy Schools Command in Naval Communications. The course included instruction in cryptography techniques and various forms of electronics and electronic equipment. (CX 9, Harvey Dep. at 3, Q9).

49. Harvey attended the Wharton School of the University of Pennsylvania from 1970 until 1972 and graduated with a Masters of Business Administration. While attending Wharton, Harvey took a number of courses involving computer operations, including courses in operations research and econometrics. In those courses he wrote applications programs that were designed to solve problems in the areas of operations research and econometrics. Computer programs were written FORTRAN language. He was not studying the hardware of computers except on a minimal basis. (CX 9, Harvey Dep. at 2, Q9, Tr at 1032).

50. Harvey was enrolled at the University of London from 1967 on, but the course he was pursuing did not require his presence on the campus. Rather he was on board ship. (Harvey Tr at 1030).

51. While serving as a Naval officer, Harvey was Operations Officer on the cable layer USS Aeolus and was responsible for the installation of a new radio shack on board, including installation of new receiver equipment, new teletype equipment, and new circuitry associated with existing decryptors and shipboard handsets and speaker systems. (CX 9, Harvey Dep. at 3, Q10).

52. While serving aboard the USS Aeolus Harvey worked closely with teams of technicians from Western Electric in connection with the cable laying work of the ship. To the extent if Harvey's technical experience in the United States Navy was such that Western Electric personnel explored the possibility of Harvey joining Western Electric. (CX 9, Harvey Dep. at 3, Q10).

53. While with the American Smelting and Refining Company (ASARCO), Harvey designed computer systems to enable the company to work with Wall Street commodities trading companies. Harvey also designed systems and programs in the FORTRAN language to perform functions in ASARCO's treasury office, and built analytical modeling systems to represent financial value of mining properties. While with ASARCO Harvey also had exposure to the operation, system and programming of an IBM 370 computer. (CX 9, Harvey Dep. at 4, Q10).

54. While serving as the controller of Pfizer, Harvey designed a Sales Management System, which was intended to manage information flow to Pfizer's U.S. sales force of approximately 1200 individuals. (CX 9, Harvey Dep. at 4, Q10).

55. Harvey did not take any courses that covered video communications, design of electronic circuits or computers at the schools he attended; viz. Yale University, University of Pennsylvania, or University of London. (Harvey Tr at 1029-1031).

56. Harvey does not know what the "NTSC" standard included in 1981. (Harvey Tr at 1039).

57. Harvey does not know whether any standard television signals in 1981 included digital signals. (Harvey Tr at 1039).

58. Harvey does not know what portion of the "NTSC" television signal in the United States in 1981 was allocated to audio. (Harvey Tr at 1039).

59. Harvey does not know what portion of the standard transmitted television signal in 1981 in the United States was allocated to audio. (Harvey Tr at 1039).

60. [There is no finding 60]

61. Harvey has no knowledge about where the video signal appeared in standard U.S. television in 1981. (Harvey Tr at 1039-1040).

62. Harvey does not know what frequency spectrum is allocated to the NTSC video signal. (Harvey Tr at 1040).

63. Harvey does not know what the frequency range of the baseband signal used in the United States for television is. (Harvey Tr at 1040).

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65. Before filing the '510 patent application on Nov. 3, 1981 for the '490 patent Harvey and Cuddihy did not build any prototypes and did not conduct any physical experiments. (Cuddihy Tr at 721).

E. Prosecution Of Applications That Led To Issuance Of '277 Patent

66. The '510 application filed in the United States Patent and Trademark Office (PTO) on Nov. 3, 1981, contained seventeen claims. (RX 1145).

67. The first Office Action with respect to the '510 application, dated July 25, 1983, rejected claims 1-17 as obvious over Crosby U.S. Pat. No. 3,845,391 in view of Lambert U.S. Pat. No. 4,381,522. The Examiner stated that Crosby discloses a recorder being controlled by an embedded signal (Fig. 1A) which is coded into data transmitted; tha

Lambert shows that a recorder can be controlled to transmit to a remote location (Fig. 1); that it is deemed obvious that the recorder of Crosby can be so controlled; and that U.S. Patent Nos. 3,833,757 to Kirk, Jr. et al., 3,987,398 to Fung, and 3,684,823 to McVoy, were cited to show control signal manipulation of remote devices. (RX 1145).

68. The applicants' response to the PTO's first Office Action with respect to the '510 application, received by the PTO on February 7, 1984, canceled claims 1-17 of the '510 application and added claims 18-30. The response enclosed a supplemental declaration acknowledging a duty to disclose as required by 37 C.F.R. 1.65(a)(1). It was argued that claims 18-30 are directed to the embodiment of the invention shown in Fig. 6C and described specifically in the specification at page 38 et seq; that as explained therein, this invention uses the signal decoder 203 of Fig. 2A (for example) for the purpose of providing graphic overlays upon receipt of selected signals broadcast by the transmitter (for example); that the claimed subject matter calls for the use of computer means to generate overlay signals (video or audio) which are selectively coupled to the user's television receiver upon detection of the instruct-to-overlay signal by means of the signal decoder 203 of fig. 2A; that the specific example contained in the specification relates to a television program such as "Wall Street Week" wherein the invention might be used to display the subscriber's investment portfolio at selected times during the normal broadcast which invention further provides for the possibility of continuously (or selectively) modifying the format or content of the overlay information stored in the microprocessor (or microcomputer) so that, for example, when the narrator causes the "embedded signal" to be broadcast, an updated record of the subscriber's portfolio is automatically displayed at the proper time during the program; that newly

submitted claims 18-25 are method claims directed to a method of communicating television program material to a multiplicity of receiver stations and claims 18 and 19 include both transmitting and receiving steps; that claims 20 and 21 are directed to the transmitting steps; that claims 22 and 23 are directed to the receiving steps; that claims 24-28 are directed to a portion of the receiving apparatus; that the method claims 18-25 pertain to systems wherein video information including television program material is transmitted to a multiplicity of receiver stations and each of the receiver stations includes a television receiver and a computer, with the computer being capable of transmitting overlay video signals to its associated receiver; that in addition, the computers can be programmed to modify the overlay video signals; and that the transmitter transmits a video signal which contains the television program material and an "instruct-to-overlay" signal which, as set forth in the various claims, causes the computer to transmit the overlay signals to the associated receivers "thereby to present a display consisting of the television program and the computer generated overlay." It was also argued that the dependent claims (claims 19, 22 and 25) additionally call for the step of transmitting information to the computers to cause the overlay signals to be modified and in this way, for example, the format or content of the overlay signals relating to a user's investment portfolio may be modified so that the information from the computer display on the screen remains current and directly relevant to the appearance and content of the television program displayed; that dependent claims 20 and 23 state that the instruct-to-overlay signal is embedded in the vertical blanking interval of the video signal; and that claims 26-30 are directed to television signal processor means and include the apparatus at the receiver station which causes the computer to generate overlay signals in

response to the embedded "instruct-to-overlay signal" from the transmitter. With respect to the rejection of claims 1 through 17 under 35 U.S.C. § 103 as being unpatentable over Crosby in view of Lambert, it was argued that while Crosby does disclose the use of an "embedded signal" accompanying television broadcast program material in Crosby, such information is used solely for the purpose of confirming that certain program material (typically advertising) has been received; that there is no suggestion in Crosby that this embedded signal can be used for the purpose of coupling a stored overlay video signal (which may be continuously updated) to the receiver at selected moments in the course of the program; that while Lambert was cited to show that a recorder can be controlled to transmit to a remote location, in Lambert, a minicomputer is responsive to signals from viewers to provide a video signal representative of the schedule of the television programs to be broadcast over a cable system; and the viewer or subscriber is then able to select a particular television program for viewing by dialing a telephone number which controls the minicomputer and here also there is no suggestion that the minicomputer can be selectively controlled so as to insert overlay video signals into existing program materials; that Fung concerns a remotely controlled tap for a cable television system while McVoy uses an embedded signal in a subscription television systems to connect the subscribers to the systems and that Kirk, Jr. et al. relate to a device for distributing commercial and supplementary video programs from common equipment to be spaced subscriber stations; and that there is no teaching that the "supplementary video programs" are to be selectively called up in the course of the commercial program based on control signals transmitted to the individuals subscribers. (RX 1145).

69. The second Office Action with respect to the '510 application, dated April 18, 1984, rejected claims 18-30 as obvious over U.S. Patent No. 4,337,480 to Bourassin et al. in view of Crosby. The Examiner stated that Bourassin et al. (Figures 1 and 6) disclose a remotely actuated computer, i.e. microprocessor, controlled overlay system for a television display including a multitude of peripheral units; that Crosby discloses the actuation of a device based on the use of a signal embedded in a television program; and that it is deemed obvious to substitute the remote actuation signal of Crosby for the equivalent signal of Bourassin et al. The Examiner cited U.S. Patent Nos. 3, 668, 307 to Fuse et al., 4,347,532 to Korver and 4,218, 698 to Bart et al. to show overlay control signals. (RX 1145).

70. The applicants' response to the PTO's second Office Action, received by the PTO on October 9, 1984, amended claims 18, 21, 24 and 26, of the '510 application and asked for reconsideration of the Examiner's rejections of claims 18-30 as obvious. It was argued that applicant's invention enables the program content of a television program to be modified in a unique manner for each of a multiplicity of users (or viewers), by causing microprocessor located at the respective subscriber stations to generate video signals in response to a control signal in the transmitted video program material; that in applicant's invention, the overlay video information is specific to the user and directly related to the video program material; that for example, in the case of a program such as "Wall Street Week," the invention may be used to display investment information unique to a subscriber at the subscriber's station and at a precise point in the course of the program at which the specific information of the user relates directly to the transmitted information of more general public interest; that as a more specific example, the performance of each user's

investment portfolio may be displayed at the user's TV set at a point during the program when each subscriber is asked to compare the performance of his or her own portfolio with measures of the overall performance of the general market; that the Bourassin and Crosby patents have nothing whatever to do with this fundamental concept and no conceivable combination of these references could result in applicant's invention; that the principal reference, Bourassin, concerns a complex microprocessor controlled system for enabling a user to switch the primary input to a television set to any one of a number of alternate peripheral units which peripheral units, video or audio, are listed in column 4 at lines 38-68; that a typical example of the way in which the Bourassin system is used is explained in column 8, line 56 et seq.; that insofar as applicants can determine, in all cases in Bourassin, the viewer determines which of a multiplicity of separate peripheral units will be connected to the receiver and as sophisticated and complex as the Bourassin system may be, there is no suggestion of combining inputs from two or more input sources to provide a single program; that there is no suggestion that the program material generated by any peripheral unit (or any other source) be coordinated in program content with the program material input to the TV set and no suggestion that video inputs can be automatically combined under the control of transmitted signals that may be embedded in transmitted video signals, to display user specific information in conjunction with a transmitted program; that since the fundamental concept of applicants' invention is not disclosed in Bourassin, the secondary reference (Crosby) cannot be combined with Bourassin in such a way as to provide applicants' claimed system; that while the Examiner states that "Crosby discloses the actuation of a device based on the use of a signal embedded in a television program," Crosby does not disclose the

concept of using an embedded signal to select video inputs to a television receiver (not that this general teaching by itself would suggest applicants' invention); that in Crosby, the device actuated by the embedded signal is merely a recorder which allows the embedded signal to be recorded for the purpose of identifying the programs (more particularly, the commercial) being transmitted by a selected broadcast station; that there is no suggestion in Crosby that the embedded signal is to be used for control purposes, nor is there any reason why the embedded signal would be used for that purpose since Crosby seeks only to identify the programs being transmitted by the station; that there is no suggestion that Crosby's embedded signal may alter the input to the television receiver (as in applicants' invention), since the recorded data sought by Crosby would lose its integrity if the input to the receiver were switched from the frequency of the selected station being monitored; that if Bourassin and Crosby were combined, the result would be the interconnection system of Bourassin wherein the program materials could be identified by using the embedded signal of Crosby so long as the station monitored by Crosby continued to be input to the TV receiver of the combined system; that it is certainly not to be expected that the combination would result in the use of Crosby's embedded signal for the purpose of switching away from the selected station in Crosby to one or another of the peripheral units of Bourassin et al., and even that combination would not satisfy the constraints of applicant's claims wherein a signal embedded in a video program signal causes a computer to transmit a user specific overlay signal related to that program material; that the claims distinguish in a number of ways over the references; that in the first place, Bourassin is concerned only with the control of a single receiver station and not a multiplicity of subscribers as in applicants' case and that a

significant feature of applicants' invention is that each of a large number of individual subscribers is capable of interacting in a selective and individual way with the television program material broadcast to the entire population; that considering independent claim 18 in relation to Bourassin, Bourassin does not transmit a video signal to a multiplicity of receivers; and therefore, none of the fundamental features of independent claims 18, 21, 24 and 26 is disclosed in Bourassin since the claims require that the video signal and instruct-to-overlay signal be transmitted to a plurality of receiver stations; that an important feature of applicants' invention is that each of the microprocessors or computers are programmed to generate overlay signals which are specifically related to the user or subscriber as well as to the program material broadcast to the entire community and thus, in applicants' invention, when the embedded control signal causes the investment portfolios (for example) to appear on the screen, the displayed portfolio at each subscriber station will represent the portfolio specific to that subscriber which concept of generating user specific information is not considered in Crosby and Bourassin. Applicants also argued that the claims have been amended to state that the overlay signals cause "the display of user specific information related to said program material;" that since Bourassin does not even disclose a multiplicity of subscriber stations, obviously he does not suggest the possibility that a single transmitted control signal may cause the display of different overlay signals at the different subscriber stations; that Crosby does not use the embedded signal for the purpose of modifying the visual display and, therefore, clearly cannot suggest the possibility that the control signal may generate user specific overlays at the individual subscribers stations;" that claims 19, 22, 25 and 28 still further distinguish over the cited references in requiring the transmission

of an overlay modification signal to the computers (of the receiver stations) in order to modify the user specific display produced by the overlay signal and it seems clear that nowhere in the prior art is there disclosed the concept of modifying a computer generated information signal based on embedded control signals within a main video program. (RX 1145).

71. The PTO's third Office Action, with respect to the '510 application, dated January 9, 1985, rejected claims 18-30 as being unpatentable over Kimura U.S. Patent No. 3,841,792 or Baer U.S. Patent No. 4,310,856 in view of Bourassin et al. and Crosby. The Examiner asserted that Kimura (Fig. 3, Col. 1) or Baer (Fig. 1, Col. 1) each disclose viewer controlled television systems in which a locally generated data is overlaid on the screen; that Bourassin et al. teach as remotely actuated computer controlled overlay for a television display including a multitude of peripheral units and Crosby show the actuation of a device based on a signal embedded in a television program; that it is deemed obvious to provide Baer or Kimura with a locally generated overlay which is controlled by an embedded signal and it is further noted that each of Baer or Kimura overlay signals that are locally generated in response to an embedded signal. Freeman et al. U.S. Patent No. 4,264,925 was cited to show multi-information interfaces. (RX 1145, RX 1133).

72. The applicants' response to the PTO's third Office Action dated July 9, 1985, amended claims 18, 21, 24 and 26 of the '510 application and asked for reconsideration of the Patent Office Examiner's rejection of claims 18-30 as obvious over the prior art. It was argued that applicants' invention deals with a system wherein each of a large number of subscribers (for example thousands or more) may wish to combine with a television program

being transmitted to all subscribers; that applicants show (1) a conventional television transmission and (2) a fully integrated system of many computers operating at once to process locally recorded data under control of a common set of control instructions input to all computers simultaneously at a single input source which system generates unique user specific information at each subscriber station; that then upon instruction the system automatically outputs this information to a multiplicity of television receivers (each of which is at a specific subscriber station) thereby generating distributed user specific combined television information and displaying it to a large audience; that at each subscriber station, this system displays user specific information that is private and unique to the subscriber and is neither known at the input source nor revealed at any other subscriber station; and that in accordance with the invention, it is possible for each subscriber automatically and simultaneously to combine with the program content in a unique way, which is not possible in any of the cited references nor in the proposed combination of references; that in the example considered in the two prior amendments, it is contemplated that each individual subscriber viewing the "Wall Street Week" program would be able to view information relating to his or her own stock portfolio that would be displayed automatically at an appropriate time in the program when the subscriber could compare his or her own unique portfolio performance information with related information contained in the program of relevance to all subscribers which unique information is generated automatically at each subscriber station by a local computer that contains recorded data (known only to the subscriber) and operates on the basis of the transmitted control instructions that control all subscriber station computers at once; that specifically, each and every subscriber could

determine whether his or her own portfolio overperformed or underperformed the portfolio of all-on-average as well as the degree of over or underperformance which fundamental concept of distributed automatic simultaneous unique combination is completely unlike anything disclosed in the new principal references Kimura and Baer and nothing in Kimura and Baer even suggests the fundamental concept of unique interaction; that insofar as the present invention is concerned, both Kimura and Baer are the same and in each case a selected message stream may be superimposed upon a television image at the will of the viewer at the receiver and in each case, the various message streams to be superimposed on the image are transmitted to the apparatus of Kimura and Baer along with the video information; that for example, Kimura explains at column 7, lines 33 et seq that "a typical number of separate messages is five, such as weather reports, stock market quotations, news, etc." which message streams are transmitted to the receivers as "character forming data" signals, and a viewer may select any one of these separate message streams to be displayed along with the transmitted video image; that in Kimura, there is no relationship between the message data and the program content and the important facts are that there are no instructions that control microprocessors or computers and that, in each case, the only message information available to the viewer is the message streams that are transmitted to the receiver along with the video information; that thus, each receiver is only capable of displaying information which has been transmitted to it; that there is no generation of the overlay information (user specific or otherwise) at the receiver; that Baer concerns a television captioning system for display of "news, weather, stock market items and the like" (col. 1, lines 9 and 10) or captioning for viewers "who may have need of an alternate

language than that being used by the performers on screen" (col. 1, lines 13-15) and in Baer the digital data representing the captioned material is superimposed on the transmitted FM sound signal by means of an ultrasonic subcarrier which information is then used to generate the desired video signals which are displayed at the receiver; that while the Examiner contends that both Kimura and Baer "disclose viewer controlled television systems in which a locally generated data is overlaid on the screen," this is an inaccurate interpretation of the primary references since, in both cases, the overlay information is not locally generated but is instead transmitted; that while it is true that the transmitted information is then used to control the generation of overlay signals at the receiver, it is clearly not the case that the overlay data is generated at the receiver; that in no case is there a suggestion that the embedded signal can be used to cause the generation of the overlay and in fact, it is more accurate to state that the caption overlay signals in Kimura and Baer are themselves embedded signals; that by the nature of both Kimura and Baer, only a relatively small number of captioned signals (e.g., 5) is possible; that all are transmitted to all subscribers, and no computer control instructions are transmitted; that by contrast in applicants' case, there is no character forming data transmitted and only computer control signals are transmitted; and that no overlay signals are transmitted to all subscribers and all are generated locally and in applicants' case there are likely to be as many different overlay signals as there are subscribers, and there is no reason why this could not number in the thousands or tens of thousands or higher. It was also argued that the claims as amended on October 4, 1984, distinguish over the primary references by virtue of the foregoing distinction; that "user specific information" means information which is unique to a user

which is completely unlike Kimura and Baer where the overlay signals are transmitted to all users and there is no user specific information; that in order to avoid any question, applicants have further amended the independent claims to state that the overlays displayed at a multiplicity of the receiver stations are different and unique to a specific user; that since the claims already require that the computer generate "user specific information related to said program material," it is clear that the claims expressly require that each of a multiplicity of receivers have the ability to generate video overlay information which is unique to that receiver and which is related to the program content; that in both Kimura and Baer, there are relatively few overlay signals and none of the overlay signals is unique to the individual receivers (in many cases, the overlay signals are also not related to the program content); that while the Examiner has contended that it would be "obvious to provide Baer or Kimura with a locally generated overlay which is controlled by an embedded signal," although this is not an issue in this case (since the combination would not result in the claimed invention), the statement is clearly in error; that Kimura specifically states that the purpose of his invention is to display the superimposed characters "at the will of the viewer at the receiver" (see the Abstract) and hence, if an embedded signal were to control the display of the overlay characters, the viewer would lose control and the very object of the patent would be defeated; that Baer is directed primarily to a system for captioning for the deaf or captioning of an alternative language which would not require selective transmission of an overlay signal and thus there would be no reason to modify the Baer disclosure to provide an embedded control signal as in applicants' case where a unique computer generated overlay message for each viewer is displayed at a particular time during a prolonged video program; that while

the Examiner has indicated that "Bourassin et al. teach a remotely actuated computer controlled overlay for a television display including a multitude of peripheral units," this is true but only to the extent that Bourassin discloses the use of a microprocessor to connect any of a multiplicity of peripheral units to a television receiver; that regardless of how the reference is interpreted, Bourassin cannot be said to relate to a subscriber system wherein each of a multiplicity of subscribers can interact uniquely, automatically and simultaneously with transmitted program material which is the essence of applicants' claimed invention; that to further distinguish applicants' claims over the cited references, applicants have amended the independent claims in this application to state that the computers at the respective receiver stations are "adapted to generate and transmit overlay signals . . .," and the amended claims require that the computers be caused "to generate and transmit their overlay signals to their associated television receivers in response to the instruct-to-overlay signal . . .," that Bourassin's concept of using a microprocessor to selectively connect peripheral units to a receiver cannot possibly be construed to read on the concept of a computer generating video signals and transmitting them in response to an instruct-to-overlay signal, as clearly set forth in all of applicants' pending claims; that it is inherent in the claims that the instruct-to-overlay signal not be a video signal which is displayed but, instead, function as a control signal to cause a video signal to be generated and transmitted to the receiver by a computer and for this reason, applicants have not proposed to further amend the claims to make this distinction express, but if it is the Examiner's position that applicants' instruct-to-overlay signal is comparable to the embedded video signals in Kimura and/or Baer, then applicants would be willing to further amend the claims to specify that the instruct-to-overlay signal is

not to be displayed; that although the Examiner has lumped all of applicants' claims together, there are important differences and the dependent claims are patentable in their own right; that specifically, claims 19, 22, 25 and 28 require the transmission of an overlay modification signal to the individual computers which enables altering the graphic technique used to represent the underlying data (e.g., a bar chart vs. a pie chart) or otherwise modifying each of the unique user specific computer generated overlay signals and is clearly not suggested in any of the cited references and indeed, the fundamental concept of using computers or data processing means to generate computer overlay signals is not disclosed in the primary references; and therefore, the requirement of independent claims 18, 21 and 24 that at least some of the computers be "programmed to process overlay modification control signals so as to modify the overlay signals transmitted to their associated receivers" cannot be suggested in the references. (RX 1145).

73. The applicants filed a supplemental amendment, received by the PTO on August 26, 1985, amending claims 18, 21, 24, and 26 of the '510 application because it is applicants' intent to make clear that the claims cannot possibly be construed to cover television systems wherein embedded signals are displayed at a multiplicity of receiver sites (as opposed to causing a computer generated overlay to be displayed); that by the nature of both Kimura and Baer, once the subscriber manually starts the system, the apparatus transmits overlay signals continuously that are superimposed on the television display and thus the contents of shift register 182 in Kimura or raster scan alphanumeric converter 70 in Baer are continuously visible to the subscriber; that embedded signals do not cause the process of generation, transmission and display and in Kimura and Baer if the superimposed

message stream has any relationship with the television program content whatever, that relationship is continuous and there is no suggestion whatsoever that the overlay may be superimposed only periodically; that by contrast, in applicants' case the overlay is only transmitted and displayed at those particular moments during the television program presentation when it is relevant and at all other times when overlay information might distract or confuse the subscriber rather than enhance the program presentation, no overlay information is displayed at the television receiver even though all apparatus is on; that in the "Wall Street Week" example, the first graphic overlay is not transmitted to the television receiver and displayed until the television program host states, "And here is what your portfolio did," and then under control of the instruct-to-overlay signal, it is transmitted to the television receiver and displayed for a particular brief period after which its transmission and display ceases. (RX 1145).

74. The PTO mailed a Notice of Allowance and Issue Fee Due for the '510 application to the applicants for "allowed" claims 18 to 30, on September 19, 1985. (RX 1145).

75. The applicants, on December 9, 1985 and pursuant to 37 C.F.R. §1.312, amended claim 21 of the '510 application to delete the requirement that the instruct-to-overlay signal be embedded in the television program signal on the ground that in the broad context of the invention it is not necessary that the instruct-to-overlay signal be an embedded signal. (RX 1145).

76. The applicants, on January 15, 1986, and pursuant to 37 C.F.R. §1.312, amended the specification of the '510 application such that Fig. 3 was redrawn as Figs. 3A,

3B and 3C and Fig. 6 was redrawn as Figs. 6F and 6G. (RX 1145).

77. The applicants, on January 22, 1986, submitted formal drawings for the '510 application to the PTO. (RX 1145).

78. The PTO, on May 12, 1986, mailed the applicants a notice withdrawing the '510 application from issue on the grounds of an April 25, 1986, PTO memo which referred to reopening prosecution for new grounds of rejection. (RX 1145).

79. A PTO Office Action with respect to the '510 application, dated August 12, 1986, rejected claims 20, 23, and 27, claiming they were drawn to new matter because in claims 20 and 23 there is no support in the original disclosure for the instruct-to-overlay signal being embedded in the vertical blanking interval and the signal was only disclosed as being somewhere in the transmission, but the exact location was never specified and in claim 27, lines 2-5, there is no support in the original disclosure of a "means (which) . . . disconnects said video program signal from said television receiver upon detection of said embedded (instruct-to-overlay) signal;" and that to perform such a disconnection would defeat the overlay concept since there would no longer be an overlay without the video program signal on the receiver. Applicants were also requested to state the differences between Girault et al. and the allowed claims. The Examiner allowed claims 18, 19, 21, 22, 24-26, 29 and 30. (RX 1145).

80. The applicants' response to the August 12, 1986, PTO's office Action, received by the PTO on March 6, 1987, amended the '510 application in an attempt to overcome the PTO's rejections. It was argued that both claims 20 and 23 have been amended to state that the instruct-to-overlay signal "is embedded in said video signal outside

the range of the television picture" which is consistent with the specification, page 8, lines 6-11 in which it is stated:

"They (the embedded signal) may appear in various and varying locations. In television they may appear on one line in the video portion of the transmission, or on a portion of one line, or on more than one line, and will probably lie outside the range of the television picture displayed on a normally tuned television set."

that with respect to claim 27, applicants have amended claim 27 to state that the video program signal is disconnected from said television receiver "upon detection of the absence of said embedded signal" and support for claim 27, as amended, can be found in the original specification at page 39, line 29 to page 40, line 1, wherein it is stated:

"When the two studio generated graphics are no longer displayed, the studio stops sending the instruction signal, and the microcomputer, 205, ceases transmitting its own graphic to TV set, 202, and prepares to send the next locally generated graphic overlay upon instruction from the originating studio."

that with respect to the differences between Girault et al. and the allowed claims, applicants' broad claims are directed to the concept of transmitting common program material to a multiplicity of subscribers and then, upon transmission of the instruct-to-overlay signal, causing a computer at each of the subscriber stations to cause television information specific to that subscriber to appear at the subscriber's television receiver and thus, at a common point in a television program broadcast to numerous subscribers, each subscriber may perceive information specific to that subscriber only; that Girault relates to an aerial navigation system wherein a moving map and aerial navigation data relevant to an individual pilot is displayed and the pilot only observes on his video screen a display of navigational information that is relevant to him; that the essential concept of applicants' invention,

namely, the periodic overlaying of user specific information with program material common to a large audience is not disclosed in Girault, and indeed, it would appear clear that in Girault, there can be no possibility of transmitting the data to be displayed to a large audience since, in Girault, each pilot (subscriber) is only interested in the navigational data that is relevant to him; that in short, nothing in Girault suggests the possibility of periodically combining user specific information with generally broadcast information; and that any such system would be contrary to the navigational scheme of Girault. (RX 1145).

81. The PTO mailed a Notice of Allowance and Issue Fee Due for the '510 application to the applicants on March 19, 1987. (RX 1145).

82. The '490 patent which issued on September 15, 1987, on the '510 application contained thirteen claims. (RX 1145, CX 3).

83. The '531 application, filed on February 14, 1986, contained seventeen claims which claims were identical to the original claims of the '510 application filed November 3, 1981 and consisted of a forty four page specification. (RX 1146).

84. Prior to examination of the '531 application, applicants filed on February 14, 1986, an amendment to the '531 application canceling claims 1-17 and adding claims 18 and 19. It was asserted that claims 17 and 18 are believed to be patentable over the prior art of record in the parent application (RX 1146).

85. The PTO's first Office Action with respect to the '531 application, dated June 27, 1986, rejected claims 18-19 as obvious over Girault et al. U.S. Patent No. 4,138,726 in view of Crosby U.S. Patent No. 3,895,391. (RX 1146, RX 1138).

86. The applicants' response to the PTO's first Office Action, dated January 2,

1987, added claims 20, 21 and 22 of the '531 application and asked for reconsideration of the Examiner's rejection of claims 18 and 19 as obvious in light of the prior art. It was argued that in its broadest concept, this invention generates and outputs (displays) information specific to each of a multiplicity of subscribers with no other subscriber having access to the information), the user specific information being coordinated with program material transmitted to all subscribers; that in the "Wall Street Week" example, in the course of a program broadcast to all subscribers, each subscriber's computer may interact with the broadcast material in such a way as to present to that subscriber information relating to that subscriber's stock portfolio at a particular point in the program and thus, conceptually, there is a program "broadcast" to all computers, each computer is programmed to process information specific to a subscriber, and each computer is caused to display that information at a time coordinated with the presentation of the program material to all subscribers; that in this application, applicant seeks to obtain claims of sufficient breadth to cover presentations other than television presentations, for example, radio and hard copy; that however, the principle remains the same and the concept clearly is not disclosed in the prior art; that Girault does not disclose the essence of applicants' invention and, therefore, whether or not there were a multiplicity of systems as disclosed by Girault, applicants' claimed invention would not result; that Girault discloses a system for displaying a moving map and aerial navigation data on an electronic screen and such data clearly is user specific but even if there were a multiplicity of such receivers, unlike applicants' claimed invention, the information presented at the individual receivers would not be coordinated with the contents of a program transmitted to all receivers; that furthermore, and equally important, in Girault the aerial

navigation data displayed is information recorded in memory 17 which "may take the simple form of a magnetic-tape cassette or a semiconductor store, for example" (column 3, lines 35-39) which means that at each receiver station, the video display is merely a display of information stored in a computer; that in contrast, the applicants' system, at each subscriber station the computer is programmed to process information specific to the subscriber and then to output (display) that information for that subscriber only; that comparing Girault (with or without Crosby) to applicants' system, in Girault there is no coordination of a multiplicity of computers with a generally broadcast program and there is no ability to cause the individual computers to process information specific to the individual subscribers; that it is unclear to applicant how the Examiner proposes to apply Crosby which has been discussed at length in the parent application; and that Crosby discloses the actuation of a recorder for the purpose of recording information that already exists and the concept of generating user specific information at a multiplicity of computer stations is not disclosed. (RX 1146).

87. The PTO mailed a Notice of Allowance and Issue Fee Due for the '531 application to applicants on April 3, 1987. (RX 1146).

88. The '725 patent, which issued on November 3, 1987, on the '531 application contained five claims. (RX 1146).

89. The continuation-in-part '096 application, filed on September 11, 1987, contained some thirty eight claims and consisted of a 557 page specification in contrast to the 44 page specification for the '531 application. (RX 1147; RX 103A; RX 1146).

90. Applicants, in the '096 application filed, with Scott as the attorney of record, an Information Disclosure Statement (IDS) on January 13, 1988, citing eight prior art

references, viz. U.S. Pat. Nos. 3,845,391 to Crosby, 3,891,792 to Kimura, 4,025,851 to Hazelwood et al., 4,264,925 to Freeman et al., 4,337,480 to Bourassin et al., 4,381,522 to Lambert, 4,138,726 to Girault et al. and 4,310,854 to Baer. The IDS was submitted with an attached PTO Form 372 "List of Prior Art Cited by Applicant" in accordance with 37 C.F.R. §§ 1.56, 1.97. It was represented that the listed references were considered of interest to the invention of the application but did not affect the patentability of the claims presented in the application for the specific reasons set forth in the IDS. (RX 1147).

91. The PTO's first Office Action, with respect to the '096 application, mailed on November 9, 1988, rejected claims 1-4, 10-13, 15, 17, 19 as unpatentable under 35 U.S.C. § 103 over Crosby or Hazelwood et al., claims 1-38 under 35 U.S.C. § 103 over den Toonder et al., U.S. Patent No. 4,323,922 and claims 21-38 under the obviousness type double patenting as being unpatentable over claims 1-5 of the '725 patent. A Known U.S. Pat. No. 4,706,282 was also cited in the Office action. It was also stated in the Office action that the "lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors." (RX 1147, RX 1134).

92. Applicants filed an amendment to the '096 application on May 19, 1989, amending claims 1, 2, 4, 5, 10, 34-37, canceling claim 38 and adding claims 39 to 101. Applicants also argued that both Hazelwood and Crosby merely record detected signals; that neither Hazelwood or Crosby has no disclosure regarding the activation or deactivation equipment external to their signal processor system; that neither Crosby nor Hazelwood has any disclosure regarding a control means activated by the detected signal to monitor the performance or output of the first control means for the simple reason that there is no such

first control means of the referenced patents; that neither Crosby nor Hazelwood disclose anything regarding detection of signals at predetermined time intervals and demodulation of the signals in conjunction with the control means responsive to activate external equipment; that neither Crosby nor Hazelwood disclose anything regarding the use of a detected signal to pass an instruction to a computer equipment; that the control signals in den Toonder include a tag on a TV program which is compared to program authorization information inserted as a control signal in microprocessor 62; that if the TV program tag matches the authorization information in the processor, den Toonder allows the viewer to see a particular program; that the authorization information is programmed in the microprocessor through an insertion mechanism controlled by the cable operator and thus, when the tag on the TV program matches the authorization information inserted by the operator, a descrambling circuit is enabled; that den Toonder discloses no monitoring means to detect the activation of the descrambler network and den Toonder provides no suggestion that such monitor would be appropriate; that den Toonder discloses no recorder means for collecting monitoring data and provides no control means for directing any information to a remote site; that den Toonder provides no apparatus for timing the receipt of data or its transmission to other parts of the systems; that den Toonder includes no buffer means for organizing signals or any of the other elements that are claimed in applicants' claims 1-20; that den Toonder also provides no disclosure that an instruction to a computer at a remote site generates any particular information; that applicants noted that the examiner states that a timely filed terminal disclaimer in compliance with 37 C.F.R. § 1.321(b) would overcome this rejection if the conflicting patent application is commonly owned; that the subject application and the '725

patent are commonly owned and applicants would properly demonstrate the common ownership upon allowance of the subject claims and are willing to file a terminal disclaimer to remove this rejection from the case. (RX 1147).

93. In the PTO's second Office Action, with respect to the '096 application, mailed on July 27, 1989, the Examiner rejected claims 1-37, and 39-101 as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as their invention and stated that, for example, 25 claims was considered sufficient. Also, claims 21-37 were rejected under the obviousness type double patenting in view of claims 1-5 of the '725 patent although the Examiner stated that a disclaimer would overcome the rejection. (RX 1147, RX 1140).

94. Applicants filed an amendment to the '096 application on January 29, 1990, amending claim 28, canceling claims 29 to 58, amending claim 59, canceling claims 60-72, amending claim 73, canceling claims 74-101, and adding claims 102-104. On the double patenting rejection, it was argued that the instruct-to-generate signal found in claim 28 is patentably distinct from the instruct-to-output signal as set forth in claim 1-5 of the '725 patent. (RX 1147).

95. The PTO mailed a Notice of Allowance and Issue Fee Due for the '096 application to applicants on March 29, 1990. (RX 1147).

96. Applicants submitted, in the '096 application, a Supplemental IDS, in accordance with 37 C.F.R. §§ 1.56, 1.99, which was received by the PTO on June 19, 1990 and which contained seven prior art references, viz. U.S. Patent Nos. 3,798,610 to Bliss, 3,842,196 to Loughlin, 3, 975,583 to Meadows, 4,230,990 to Lert, 4,334,542 to Mangold,

4,425,581 to Schweppe and 4,488,179 to Kruger. The Supplemental IDS attached Form PTO-1449 titled "List of Patents and Publications for Applicant's Information Disclosure Statement." It was represented that the listed references were not considered to be material to or to affect the patentability of the allowed claims in the application. It was also represented that the references came to applicants' attention in the period since the submission of the January 29, 1990 amendment and that while applicants realized that, under MPEP Section 609, the Examiner is not required to consider the cited references, applicants did not consider any action by the Examiner necessary; and that the "new references" were cited solely to complete the record before the Patent Office. Applicants in the Supplemental IDS made concise statements regarding the listed patents in accordance with 37 C.F.R. § 1.98(a)(2). (RX 1147, RX 1155).

97. The '825 patent, from the '096 application, which issued on October 23, 1990, contained twenty five claims. (RX 1147).

98. The '126 application, filed on September 25, 1990, submitted twenty six claims for examination. (RX 1148, RX 104 at 1).

99. Applicants filed, in the '126 application, an IDS, in accordance with §§ 1.56, 1.97, which was received in the PTO on February 15, 1991 and which contained nineteen prior art references, viz. U.S. Patent Nos. 3,684,823 to McVoy, 3,798,610 to Bliss et al., 3,833,757 to Kirk, Jr. et al., 3,842,196 to Loughlin, 3,845,391 to Crosby, 3,891,792 to Kimura, 3,975,583 to Meadows, 3,987,398 to Fung, 4,025,851 to Hazelwood et al., 4,138,726 to Girault et al., 4,230,990 to Lert Jr. et al., 4,264,925 to Freeman et al., 4,310,854 to Baer, 4,323,922 to den Toonder et al., 4,334,242 to Mangold, 4,337,480 to

Bourassin et al., 4,381,522 to Lambert, 4,425,581 to Schweppe et al. and 4,488,179 to Kruger et al.. With the IDS, there was included an attached PTO Form 1449 "List of Prior Art cited by Applicant." It was represented that the listed references were of interest but did not affect the patentability of the claimed subject matter for specific reasons, the applicants making concise statements regarding the listed patents in accordance with 37 C.F.R. § 1.98(a)(2). (RX 1148).

100. The PTO's first Office Action with respect to the '126 application, mailed March 22, 1991, rejected claims 1-26 for obviousness-type double patenting over the invention as set forth in claims 1-25 of the '825 patent. (RX 1148, RX 1136, RX 104, Paper No. 3 at 2).

101. Applicants' response to the first March 22, 1991 Office Action, in the '126 application, received by the PTO on September 12, 1991, amended claims 16, 17, 19, and 23-25 of the '126 application and argued that the claims in issue include a number of features not recited in any of the '825 claims. (RX 1148).

102. The PTO mailed a Notice of Allowance and Issue Fee Due in the '126 application to applicants on September 27, 1991. (RX 1148, RX 1132, RX 104, Paper No. 6).

103. The '414 patent, which issued on April 28, 1992, contained twenty six claims. (RX 1148).

104. The '226 application, filed on March 10, 1992, presented 36 claims for examination. Claims 34, 35 and 36 of those claims are identical to claims 1, 2 and 3 in the '501 application which was later filed. (RX 1149, RX105 at 1, RX 106, RX 129).

105. The PTO's first Office Action with respect to the '226 application, mailed to applicants on August 21, 1992, restricted claims 1-36, specifically claims 1-32, which were said to be drawn to data collection systems, methods and components (Group I) and claims 33-36 where were said to be drawn to methods of processing control signals and controlling equipment (Group II). (RX 1141, RX 105, Paper No. 5 at 1-2).

106. In Paper No. 6 of the '226 application, dated October 9, 1992, applicants traversed the restriction requirement to the extent that the Patent Office Examiner found claim 33 to be separate and distinct from claims 1-32, but applicants otherwise acceded to the restriction requirement and elected Group I (claims 1-33 according to applicants) for prosecution. (RX 105, Paper No. 6 at 23-24).

107. In Paper No. 6 of the '226 application, applicants also amended certain claims and added claims 37 through 74. Applicants in a supplemental IDS in "accordance with the duty of disclosure under 37 C.F.R. § 1.56(a) and in conformance with the procedures of 37 C.F.R. §§ 1.97-98 and M.P.E.P. § 609" directed the Examiner to Reissue patent 31,735 listed on an attached Form PTO-1449. It was requested that Reissue patent 31,735 be expressly considered during prosecution and that the cited reference be made of record. (RX 105, Paper No. 6 at 14-24).

108. It was applicants' view in Paper No. 6 of the '226 application that claims 37-74 belonged to the same group as claims 1-33. (RX 129, Scott Dep. at 610).

109. On February 4, 1993, the Patent Office Examiner allowed claims 1-74 of the '226 application. (RX 105, Paper No. 9).

110. On February 10, 1993, applicants requested clarification of the claims stating

that the Patent Office Examiner's allowance of claims 1-74 conflicted with the Office Action dated August 21, 1992, in which the Examiner interposed a restriction requirement as to claims 1-32 (Group I) and claims 33-36 (Group II), and asserted that the Notice of Allowability should apply only to claims 1-33 and 37-74. (RX 105, Paper No. 12 at 1).

111. On April 13, 1993, the Examiner issued a Supplemental Notice of Allowability allowing claims 1-33 and 37-74. (RX 105, Paper No. 14).

112. The '654 patent which issued on August 3, 1993, contained seventy one claims. (RX 1149).

113. The '501 application, which was filed on May 3, 1993, submitted three claims submitted for examination. The three claims corresponded to claims 34, 35 and 36 which were included in the original claims of the '226 application as filed on March 10, 1992. (RX 106 at 1, RX 129, Scott Dep. at 621, RX 1149, RX 105).

114. Applicants filed, in the '501 application, a first IDS which was received by the PTO on June 24, 1993 and listed thirty prior art references. The IDS is dated September 17, 1993 and initialed by the Examiner. The IDS was filed in "accordance with the duty of disclosure under 37 C.F.R. § 1.56(a) and in conformance with the procedures of 37 C.F.R. §§1.97-98 and M.P.E.P. § 609" and the Examiner was directed to the listed references. The references cited in the IDS were:

U.S. PATENT DOCUMENTS	
PATENT NUMBER	NAME
3,684,823	McVoy
3,798,610	Bliss et al.
3,833,757	Kirk, Jr. et al.
3,842,196	Loughlin
3,845,391	Crosby

3,891,792
3,975,583
3,987,398
4,025,851
4,138,726
4,163,254
4,225,884
4,230,990
4,245,245
4,247,106
4,264,925
4,310,854
4,312,016
4,323,922
4,334,242
4,337,480
4,365,110
4,381,522
4,398,216
4,404,589
4,425,581
4,488,179
Re: 31,735

Kimura
Meadows
Fung
Hazelwood et al.
Girault
Block et al.
Block et al.
Lert Jr. et al.
Matsumoto et al.
Jeffers et al.
Freeman et al.
Baer
Glaab et al.
den Toonder et al.
Mangold
Bourassin et al.
Lee et al.
Lambert
Field et al.
Wright, Jr.
Schweppe et al.
Kruger et al.
Davidson

FOREIGN PATENT DOCUMENTS	
DOCUMENT NUMBER	COUNTRY
0 055 674	EPO
56-47179	Japan

(RX 46, RX 106, Paper No. 2).

115. A preliminary amendment filed in the '501 application and docketed in the PTO on July 14, 1993, added claims 4-56 to the application. It was this amendment which added to the '501 application claims 6, 7 and 44 in issue. No reason was given in the preliminary amendment for the addition of claims 6, 7 and 44. (RX 106, Paper No. 4).

116. The PTO's first Office Action with respect to the '501 application, mailed to applicants on September 27, 1993, rejected claims 1-3 under the "judicially created doctrine

of obviousness type double patenting as being unpatentable over the prior inventions as set forth in claims 1-71" of the '654 patent. Claims 1-3 corresponded to claims 34, 35, 36 of the '226 application which claims the Examiner in his first Office Action in the '226 application characterized as drawn to methods of processing control signals and controlling equipment, (RX 106, RX 1142, RX 1141, RX 105, Paper No. 5 at 1-2).

117. Applicants filed, in the '501 application, a letter bringing a discrepancy to the attention of the PTO, which was received by the PTO on September 30, 1993, and which stated that the first Office Action indicates that the application was examined only with respect to the originally filed claims 1-3 which read:

1. A method of processing control signals and controlling equipment at a remote site based on broadcast transmission including:
 - (a) the step of receiving at said remote site a broadcast carrier transmission;
 - (b) the step of demodulating said broadcast carrier transmission to detect an information transmission therein;
 - (c) the step of detecting and identifying at said remote site control signals associated with said information transmission;
 - (d) the step of passing at least a portion of said control signals to a computer control means at said remote site;
 - (e) the step of said computer control means determining based on instructions included in said control signals whether receiver means at said remote site is operating; and
 - (f) the step of directing, based on the result of said determination step, said information transmission and a selected portion of said control signals to (1) said receiver means and associated computer equipment or (2) a recorder means activated by said computer control means.
2. A method of processing control signals and controlling equipment at a

remote site based on a broadcast transmission, including:

- (a) the step of receiving at a remote site a broadcast carrier transmission;
- (b) the step of demodulating said broadcast carrier transmission to detect an information transmission therein;
- (c) the step of detecting and identifying at said remote site control signals associated with said information transmission.
- (d) the step of passing at least a portion of control signals to computer control means at said remote site;
- (e) the step of comparing a selected position of said control signals with a code inputted into said computer control means on the basis of information contained in said information transmission; and
- (f) the step of activating a printing means when the comparison step provides a match between the comparison step provides a match between the inputted code and the selected portion of the control signals.

3. A method of processing control signals and controlling equipment at a remote site based on a broadcast transmission, including:

- (a) a step of receiving at said remote site a broadcast carrier transmission;
- (b) the step of demodulating said broadcast carrier transmission to detect an encrypted information transmission therein;
- (c) the step of detecting and identifying at said remote site control signals associated with said encrypted information transmission;
- (d) the step of passing at least a portion of said control signals to a computer control means at said remote site;
- (e) the step of said computer means identifying the remote site receiver, determining an identification code for said remote site receiver and comparing said identification code for said remote site receiver to a list of authorized information recipients;

- (f) the step of said computer means directing a selected portion of said control signals to a decryptor means based on a favorable result of said identification step; and
- (g) the step of decrypting said information transmission.

and that the first Office Action did not consider the claims added in the preliminary amendment, viz. claim 4-56. (RX 106, RX 47).

118. Applicants filed on November 5, 1993, in the '501 application, a Supplemental IDS (second IDS), in accordance with the duty of disclosure under 37 C.F.R. § 1.56(a) and in conformance with the procedures of 37 C.F.R. §§ 1.97-98 and M.P.E.P. § 609, and which listed some 176 prior art references. (RX 106, Paper No. 5, RX 1152).

119. Applicants filed, in the '501 application, in accordance with the duty of disclosure under 37 C.F.R. § 1.56(a) and in conformance with the procedures of 37 C.F.R. §§ 1.97-98 and M.P.E.P. § 609, a further supplemental IDS (third IDS) received by the PTO on November 22, 1993, which listed eight references. In connection with the third IDS, errors were pointed out in the second IDS. Also a list entitled "Reference Category List" was provided, which listed categories of the submitted references and their identified relevance to each presiding claim and which further identified the references that in applicants' views were most relevant to each pending claim. It was stated that the list is submitted "merely to assist the Examiner" and that although applicants have "attempted to identify those references that are believed to be the most relevant to each claim, there may exist other relevant references not identified as such." Said list grouped patents into Groups A - S and included an additional group entitled "Other Patents Unclassified by Group." (RX 1153 at 1-3 of enclosure). Additionally included as part of the Reference Category List was

a list entitled "Most Relevant Reference Categories . . . On a Claim by Claim Basis." (RX 1153 at 4-6). The Most Relevant Reference Categories list listed each claim individually and applied to each claim a number of groups from the Reference Category list allegedly including the most relevant references to that claim. (RX 1153 at 2 of IDS, at 4-6 of enclosure). The submission of references in the '277 patent application was done as a collaborative effort by Scott, in part, by Harvey, in part, and by those under the supervision of Mr. Scott, in part. (Scott Tr at 2866).

120. Applicants filed, in the '501 application, another Supplemental IDS (fourth IDS) which was received by the PTO on February 1, 1994 and which listed 49 prior art references. It stated:

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

In accordance with the duty of disclosure under 37 C.F.R. § 1.56(a) and in conformance with the procedures of 37 C.F.R. §§ 1.97-98 and M.P.E.P. § 609, the attention of the Patent and Trademark Office is hereby directed to the references listed on the attached Form PTO-1449. Although all cited references may be relevant, Applicants would like to bring to the Examiner's attention U.S. Patent No. 4,396,595 to Yanagimachi et al. Copies of the listed references are provided herewith.

It is respectfully requested that the information above be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom.

(RX 106, Paper No. 8, RX 1154).

121. The second, third and fourth IDS's in the '501 application are dated March 30, 1994 by the Examiner. (RX 106, Paper Nos. 5, 6 and 8).

122. The Examiner initialed every form 1449 sheet filed with the four IDS during the prosecution of the '501 application. (RX 106, Paper Nos. 2, 5, 6 and 8).

123. The PTO mailed a "Notice of Allowance and Issue Fee Due" and "Notice of Allowability" on March 31, 1994. Said "Notice of Allowability" stated in pertinent part:

1. In view of the earlier filed - later processed preliminary amendment of July 14, 1993 [which added claims 6, 7 and 44 in issue], the rejection of September 27, 1993 is withdrawn.
2. Claims 1-56 [which included claims 6, 7 and 44 in issue] are allowable over the prior art of record.
3. The following is an Examiner's Statement of Reasons for Allowance: The claims are allowed because no prior art could be found which would render obvious, in a signal processing system, the use of digital detection in a switched input receiver.

(RX 106, Paper No. 100; RX 1131).

124. On April 7, 1994, the PTO received an amendment under 37 C.F.R. § 1.312(a) which amendment to claims 30 and 56 "was said to be directed to matters of form." (RX-106).

F. Art Disclosed To Examiner By Inventors

125. Articles presented to the patent examiner for consideration with the '277 Patent, including: (1) "ORACLE - An Information Broadcasting Service Using Data Transmission in the Vertical Interval" by G.A. McKenzie, published in or before January 1974 (the McKenzie reference) (CX 338); (2) "Oracle - Broadcasting the Written Word" by A. James, published in or before January 1974 (the James reference) (CX 339); (3) "The Wired Household" by E. Bryan Carne, which accomplishes at least the instruction of receiver and equipment via a broadcast transmission (the Carne reference) (CX 340); and (4) "CEEFAX: A Proposed New Broadcasting Service" by S. M. Edwardson and A. Gee , published in or before January 1974 (the Edwardson reference) (CX 341). (CX 2 at 4, Davis

Tr at 3240-42). The McKenzie and James references describe the features of the British Independent Broadcasting Authority's teletext system known as ORACLE. (CX 338 at HS 09228, CX 339 at PMC 02433). The Edwardson reference describes CEEFAX, the British Broadcast Service's teletext system. (CX 341 at PMC 002427). The Carne reference discusses the different teletext systems that were being tested in 1976, including the British and French systems, and describes the advantages that might be given to a user if they had a teletext-capable television receiver. (CX 340 at HS 008469).

126. The ORACLE teletext system described in the McKenzie and James references transmits textual data in the vertical blanking interval of television signals for display on a viewer's television set. The teletext data is organized into "magazines" which comprise "pages" of text. A "page" consists of the text that will be viewed on the television display at one time. Viewers select a desired page by entering a corresponding "page number" on a numeric keyboard connected to the receiver. The viewer may also use the keyboard to select whether to have the teletext data displace, or be superimposed upon, the normal television program. (CX 338 at HS 09228, 9231; CX 339 at PMC 002433).

127. The ORACLE system also provides for the transmission of simple graphics. The pattern of dots forming each graphics character is transmitted in the same manner as textual data. (CX 338 at HS 09231; CX 339 at PMC 02433).

128. The James reference suggests that the ORACLE system could be used to provide television program subtitles for deaf viewers or for those who do not understand the language of the program. (CX 339 at HS008482-8483).

129. In the ORACLE system, the teletext data is transmitted on line 16 of the

vertical interval. The McKenzie reference suggests, however, that the teletext data could also be transmitted on lines 17, 18 and 330, 331. Each line used for transmission carries a "segment" of teletext data consisting of 10 characters. Each row of teletext that will appear on a display screen comprises 40 characters, or four segments of teletext data. (CX 338 at HS 09228; CX 339 at PMC 002434). The segments of teletext data are individually addressed with a page number, row number and segment number to eliminate the need to transmit "blank" segments to fill partial rows of data. (CX 338 at HS 09228).

130. In the ORACLE system, the entire video signal is passed to a data receiver which extracts the data and checks to see whether it is ORACLE data. If so, the receiver checks the page number contained in the segment's address, and, if it matches the page selected by the viewer, feeds the data to the text signal generator input store. From the input store, the teletext data is fed first to a page store, which is capable of storing one entire page of teletext. Subsequently, rows of teletext are fed from the page store to a row store, which presents the data to the character generator one character at a time. (CX 338 at HS 09230; CX 339 at PMC 002434).

131. In the CEEFAX teletext system described in the Edwardson reference, the teletext information is transmitted in the form of ASCII encoded data, with a seven-bit word being used to describe each character, and a parity bit added as protection against errors. (CX 341 at PMC 002429). If the receiver detects an error in the transmitted data, the character is not written to the data store, leaving undisturbed the character previously written in the same location. (CX 341 at PMC 002430). The teletext receiver contains special alphanumeric character generating circuits that receive the encoded information and produce

video signals forming the required characters for display on a television screen. The text of CX 341 (at HS008475 = PMC 002427, third column), indicates that "special alphanumeric character-generating circuits are controlled by the received data pulses and produce video signals forming the required characters for display on a television screen." A page of CEEFAX teletext consists of 32 characters per row and 24 rows per page. (CX 341 at PMC 002428).

132. In the CEEFAX teletext system described in the Edwardson reference the teletext information is transmitted in the form of ASCII encoded data, with a seven-bit word being used to describe each character, and a parity bit added as protection against errors. (CX 341 at HS008477). If the receiver detects an error in the transmitted data, the character is not written to the data store, leaving undisturbed the character previously written in the same location. (CX 341 at HS008478). The teletext receiver contains special alphanumeric character-generating circuits that are controlled by the received data pulses and produce video signals forming the required characters for display on a television screen. The transmitted teletext is organized into magazines that consist of pages of data for display. (CX 341 at HS008475). A page of CEEFAX teletext consists of 32 characters per row and 24 rows per page. (CX 341 at HS008476).

133. In the CEEFAX system described in the Edwardson reference, the teletext data is transmitted on lines 17 and 18 of the vertical blanking interval. (CX 341 at PMC 002428). The information for one character row is carried in one field on two lines. (CX 341, at HS008477 = PMC 002429, third column). The data for each row of teletext is accompanied by a page number, row number, and the time of day. (CX 341 at PMC

002428).

134. In the CEEFAX system described in the Edwardson reference, the teletext data is transmitted on lines 17 and 18 of the vertical blanking interval. (CX 341 at HS008476). One row of displayable data is transmitted on two data lines in one field. (CX 341 at HS008477). The data for each row of teletext is accompanied by a page number, row number, and the time of day. (CX 341 at HS008476).

135. Because each row of information is fully addressed, it is possible for the receiver to place the data in the correct position in the page store, regardless of whether the rows of the selected page are transmitted consecutively or not. In fact, the order chosen for transmission of the CEEFAX system was to begin with row 0 of page 1, row 0 of page 2, etc. up to row 0 of page 31, and to follow with row 1 of page 1, row 1 of page 2, etc. This row-sequential method of transmission enables viewers to almost instantaneously begin viewing a newly selected page, row by row, rather than waiting for the teletext to cycle through the whole of each page. (CX 341 at PMC 002431).

136. The CEEFAX system described in the Edwardson reference contains "special-purpose" pages for subtitle and news flash features. (CX 341 at PMC 002429).

137. The Carne reference describes "an all-encompassing household communications/information system" that supports three subsystems: information and entertainment, command and control and administration. (CX 340 at HS 008473). In particular, the reference describes how combining microprocessors with conventional hardware in the home could be used to: (1) control the use of electricity; (2) turn the television receiver into a programmable information/entertainment center; and (3) use the

telephone for meter reading, alarm reporting, and the remote monitoring and control of lighting, heating and air conditioning. With respect to television sets, the reference suggests that day, date, time, and channel number may be superimposed on the television picture at will. If teletext is available, the system could also be used to perform signal decoding, page selection, and storage of information, as well as generate graphics. (CX 340 at HS 008469).

138. The Carne reference contains a teletext "primer," that has some information about different teletext systems, including the British and French versions of teletext. (Davis Tr at 3242-43; CX 340 at HS008471). The teletext primer also mentions the adaptation of the British and French teletext systems for testing in the United States. (CX 340 at HS008471).

139. The Carne reference contains a teletext "primer," that references different teletext systems, including the British and French versions of teletext. (Davis Tr at 3242-3243; CX 340 at HS008471). The teletext primer also mentions the adaptation of the British and French teletext systems for testing in the United States. (CX 340 at HS008471).

140. United States Patent No. 4,054,911 (the Fletcher reference), was presented to the patent examiner for consideration with the '277 patent in a Supplemental Information Disclosure Statement which cited forty nine references. (CX 2 at 2, RX 1555).

141. The Fletcher reference discusses the transmission of control instructions for a local microcomputer and other information as pseudo video scan lines in common video signal transmission media, such as a television transmission. (RX 1555, col. 2, ll. 41-47; RX 1555, col. 4, ll. 11-23).

142. In the Fletcher reference, the transmitted computer programs and information

are organized into individually addressed pages and rows, with a program typically comprising more than one page. (RX 1555, col. 6, ll. 3-7, 23-25; RX 1555, col. 7, ll. 50-61 and Figures 1, 2).

143. The comparator means and the buffer storage means in the Fletcher reference receive the transmitted information and control the loading of selected control instructions or displayable data into the local storage means. (RX 1555, col. 4:4-11).

144. In the Fletcher reference, users select desired programs or information by entering the corresponding page numbers on a local keyboard. (RX 1555, col. 6, ll. 25-26). The system then uses a comparator means and a buffer storage means to selectively store the pages containing the programs or information chosen by a user into a local storage means. (RX 1555, col. 3, ll. 1-11; RX 1555, col. 4, ll. 4-11).

145. In the Fletcher reference the local storage means is connected to a microcomputer or microprocessor which is used to execute the computer program instructions. (RX 1555, col. 2, ll. 64-67; RX 1555, col. 3, ll. 23-27, 40-43).

146. The Fletcher reference and a Hedger article not disclosed to the Examiner describe the transmission of computer programs as "pages" of data embedded in a television transmission. (RX 175, at TCE 0100003028; RX 1555, at col. 6, ll. 3-7, 23-25; RX 1555, col. 7, ll. 50-61 and Figures 1, 2).

147. The systems disclosed in the Fletcher reference and the Hedger article receive transmissions containing programs, and select a particular program for storage based upon a user's input to a keypad or remote control. (RX 175 at TCE 0100003030; RX 1555, col. 4:4-11).

148. In the systems disclosed in the Fletcher reference and in the Hedger article users select computer programs by entering the page numbers of a desired program. (RX 175 at TCE 0100003028; RX 1555, col. 6, ll. 25-26).

149. United States Patent No. 3,936,595, (the Yanagimachi reference) was presented to the patent examiner for consideration with the '277 patent, in a Supplemental Information Disclosure Statement which cited forty nine references. (CX 2 at 2; RX 1542).

150. In the Yanagimachi reference, program materials and control signals are simultaneously transmitted. The control signals are used at the receiver end to construct programmed information by combining transmitted program materials. (RX 1542, col. 1).

151. At the receiver, the transmitted control signals are used to construct complete program information from the transmitted program materials. (RX 1542, col. 1, ll. 13-16).

152. [There is no finding 152]

153. The systems described in both Yanagimachi and Iijima process the signals based on control information contained in the actual transmission. (RX 213, col. 6, ll. 38-57; RX 1542, col. 1, ll. 10-16).

154. United States Patent No. 4,310,854 issued to Ralph Baer (the Baer patent) was presented to the patent examiner for consideration with the '277 patent. (CX 2 at 3; Davis Tr at 3245-46; RX 220).

155. The Baer patent is directed to a system for transmitting and displaying closed captioning. (Davis Tr at 3245-46; RX 220, col. 1, l. 46 through col. 2, l. 5).

156. In the system described in the Baer patent, the caption information is transmitted as digital data superimposed on the transmitted FM sound signal. (RX 220, col.

1, ll. 46-51).

157. In the system described in the Baer patent, at the receiving end, the data is extracted, stored, reformatted and used to drive a character generator. (RX 220, col. 1, ll. 63-68). The character generator recreates the video signals for the closed captions. (RX 220, col. 1, l. 66 through col. 2, l. 1). These video signals are applied to a crow bar modulator which overlays the alphanumeric characters on the pictorial presentation. (RX 220, col. 2, ll. 1-5; RX 220, col. 3, ll. 53-58).

158. The Baer patent discloses the transmission of closed captions as digital information contained in a television transmission. (RX 220, col. 1, ll. 46-51).

G. Domestic Industry

159. The business of PMC consists primarily of licensing its intellectual property and prosecution of patent applications. PMC also pursues joint venture partners to develop its patented inventions. (Metzger, Tr at 180-81, 205).

160. As of June 11, 1997, with respect to any of PMC's current licensees, PMC does not design any tangible products for those licensees, nor does it work with manufacturers of those licensees' products in any way, nor does PMC monitor the quality of those licensees' products or services in any way, nor does PMC do any kind of safety checking on the products produced by those licensees, nor does PMC participate in any marketing efforts made on behalf of the products or services licensed under its patents. (Metzger, RX 128 at 469, 470).

161. When Metzger was asked whether PMC consults with any of its licensees on any kind of new product or service design, PMC's Metzger testified (RX 128 at 470-474):

A. Yes.

Q. Would you please describe those efforts?

A. I've had discussions with The Weather Channel and I'm continuing to have discussions with The Weather Channel as to products and services, interactive products and services that they may or may not introduce in the future that would use our patents.

Q. Does anyone at PMC consult with any other of its licensees regarding new products or services?

A. Not at this time.

Q. Would you please describe for me the nature of your consulting endeavors?

* * *

THE WITNESS: There are two forms. One is The Weather channel is interested in our view of companies that may infringe their exclusive license with us and they are also interested in our view of how their option agreement for additional license rights particularly in light of interactive Weather Channel services might be implemented and protected with our intellectual property.

BY MS. NELSON:

Q. What form does your participation in this consultation take?

A. Well, there have been meetings with their outside patent counsel and our outside patent counsel to discuss some of the technical patent issues. There's a planning session scheduled for next week in Atlanta with the business people that I'm participating in as part of their task force, their business task force and there have been telephone conversations between me and Weather Channel people.

Q. From PMC's point of view what is the optimum outcome of these negotiations?

* * *

THE WITNESS: We -- our goal is for our licensees to have -- it

sounds so trite -- have meaningful licenses that are helpful to their business situation and we believe that Weather Channel is greatly advantaged by the intellectual property that they've purchased from us and that in a -- so if they have been benefited from the license and the money they've paid us that's good.

Also if we can design some products and services that they implement on an incremental basis it could potentially mean more income for us which is obviously good and as these interactive embodiments of the Harvey patents, of the PMC patents become implemented then other companies that are not weather related may well see the -- may be easier to show them the value of our patents and they will be more interested in taking licenses from us so we see them as kind of a lead licensee in this and we're -- hope they are greatly benefited from them.

BY MS. NELSON:

- Q. Are new products and services actually being developed from an engineering point of view?
- A. By The Weather Channel?
- Q. By anyone.
- A. I believe so.
- Q. Do you participate in that development?
- A. Our relationship with The Weather Channel is evolving and I think that will probably happen in the future.
- Q. Is PMC involved at present in engineering any new products or services for The Weather Channel?
- A. No.
- * * *
- Q. . . . Do the new products and services being engineered by The Weather Channel use the '277 patent?
- A. I believe they will.

- Q. What are your duties or responsibilities as part of the business task force of The Weather channel which will be meeting next week?
- A. Phase one is to attend and contribute if appropriate.
- Q. What is the purpose of the meeting?
- A. Looking at the development of new products and services and also what other competitors of theirs are doing in the industry. I think I just answered that one.
- Q. What do you mean by contribute if appropriate?
- A. They've asked me for my ideas and thoughts and what -- from PMC's perspective what's -- contribute knowledge.

162. The business of PMC today is (1) the prosecution of patents which John Harvey does and Ms. Metzger is not involved in at all, (2) licensing and (3) to a small extent, it's looking for joint venture partners and the development of business. (Metzger Tr at 180).

163. McCandless is PMC's financial and administrative officer of the company and he supports the licensing efforts and the prosecution of the patent efforts. Caird worked with Metzger on licensing. PMC has an administrative assistant or secretary who's full time and primarily supports Metzger and Caird in the licensing efforts PMC also has a part-time general counsel. (Metzger Tr at 181).

164. Since the first half of 1994, inventor Harvey has focused his time heavily on the prosecution of patent applications and some time in the first half of 1994, Harvey drastically reduced his involvement in licensing for PMMC or PMC. Prior to some time in the first half of 1994, Harvey was involved in licensing for PMMC and one license that he handled was the negotiation of the license between StarSight and PMMC. (Harvey Tr at

1054, 1055).

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166. PMC licensees want to be sure that there are no additional claims in any future patent or any other patent that could be at issue against them and its PMC's business accommodation to include all of the patents in a particular field of use in a license. (Metzger Tr at 243).

167. There are no PMC licenses that exist solely with respect to the '277 patent. (Metzger Tr at 243).

168. In PMC's efforts to license PMC patents, Caird is not aware of any attempt by PMC to license a single patent as opposed to a portfolio of patents. (RX 125 at 190).

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170. As a part of its licensing efforts, PMC has sent a brochure entitled "Direct Broadcast Satellite Patent Coverage" to many different companies. That brochure focuses on PMC patented technologies that relate to Direct Broadcast Satellite systems. It reads in part:

PMC's technologies are divided into two principal areas, Infrastructure Technologies and the PMC System.

PMC's Infrastructure Technologies define the infrastructure of today's so-called convergence of communications and computing in a networked environment. The PMC System is an integrated system of communication that enables content providers to create, simultaneously for all members of an audience of any size, "personalized media" -- video, audio and/or electronic print content which have relevance to audience members on an individual-by-individual basis.

The Companies technologies are covered by six issued U.S. patents . . . [U.S. Patent Nos. 4,694,490, 4,704,725, 4,965,825, 5,109,414, 5,233,654 and 5,335,277], and over three hundred pending patents. All six patents are based on disclosure in the Company's first U.S. patent filing in 1981 [Serial No. 317,510 filed 11/3/81]. This early disclosure and end-to-end focus has resulted in a broad portfolio of intellectual property that PMC believes to be seminal -- comparable to market defining companies such as Polaroid and Xerox.

PMC is also aggressively prosecuting extensive coverage internationally based on it's 1987 U.S. application [Serial No. 96,096 filed 9/11/87]. Filings have

been made in Japan, Australia and the European Patent Office which covers Austria, Belgium, France, Germany, Italy, Luxembourg, the Netherlands, Sweden, Switzerland and the United Kingdom.

(CX 18 "Direct Broadcast Satellite Patent Coverage" at 3, ¶ 4 (PMC 301330); Metzger, RX 128 at 418-419).

171. PMC in sending out a draft contract to potential licensees based on a working document from PMC's Sony experience. Metzger estimated that PMC has approved some 40, 50 companies, not 2000 and not 3. (Metzger Tr at 194).

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175. PMC drafted a document entitled "Proposal to Formalize a Business

Relationship Between Viacom International and Personalized Media Communications" dated March 10, 1995. (RX 14; Cairn, RX 125 158-159).

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180. In licensing discussions with Hewlett-Packard, PMC gave Hewlett-Packard an overview of both PMMC's issued and pending patents. (CX 19).

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186. Metzger gave Caird a copy of the April 26, 1993 draft letter to ARC to keep Cairn informed of her activities. (Caird, RX 125 at 149-150; RX 12).

187. On January 13, 1995, Caird of PMC sent a letter to Ann Kirschner of the National Football League (NFL) in order to explore the possibility of licensing the NFL to the PMC patents. (RX 13; Metzger Tr 246-247; Caird, RX 125 152-153).

188. In his letter dated January 13, 1995 to Ann Kirschner of the NFL, Caird described some reasons why the NFL might want to license the PMC patents. (RX 13;

Caird, RX 125 153).

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191. At the time Caird wrote the January 13, 1995 letter to Kirschner, Cairn was Senior Vice President of PMC. (M. Metzger Tr 250).

192. Metzger was aware that Caird had written the January 13, 1995 letter to Kirschner. (Metzger Tr 247).

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195. PMC engaged in litigation with The Weather Channel in the U.S. district court for the eastern district of Virginia in which litigation PMC alleged infringement of the '277 patent, the '825 patent and the '414 patent. The complaint was dated March 9, 1995. (CX 13).

196. The Weather Channel litigation resulted in a "Settlement Agreement And Mutual General Release" as well as a "Patent License Agreement For Landmark Communications, Inc. And The Weather Channel, Inc." (CX 14, CX 15).

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198. An Agreement to Enter License Agreement and Licensable Product Option Agreement by and between PMMC, Starsight and Sony, was entered into as of October 31, 1995 and is currently in effect. (Metzger, Tr at 188; CX 12).

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205. The Weather Channel license was entered into on January 31, 1996 and is currently in effect. (Metzger, Tr at 192; CX 15).

206. As part of resolving the federal court litigation, the Weather Channel was desirous of obtaining certain licenses in and options to license the subject patents, as that term is defined in the license agreement. (CX 15 at 2).

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209. PMMC sought the advice of experienced patent professionals about how best to commercialize its patents. (RX 8 at 1)(BFF 119)

210. The advice which PMMC received from experienced patent professionals about commercializing its patents made sense to PMMC as reflecting a realistic view of exploiting patents. (RX 8 at 1) (BFF 120).

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212. CX 101 is a Summary Chart showing three categories of expenditures related to PMC's business "Litigation," "Professional and Consulting Fees" and "Operating Expenses." (McCandless, CX7, at 3, Q10).

213. The time period covered by CX 101 (July 1, 1993 to March 31, 1997), was selected because it begins the calendar quarter following the filing of the application that resulted in the issuance of the '277 Patent in August, 1994 and ends with the most recent calendar quarter. (McCandless, CX 7, at 3, Q11).

214. Because the sale of assets of PMMC to PMC in December 1995 transferred the patent portfolio and the responsibilities of licensing the patent portfolio, seeking further patent rights and enforcing patent rights from PMMC to PMC, CX 101 generally reflects expenditures made by PMMC from July 1, 1993 to the end of 1995, and expenditures made by PMC since that date. (McCandless, CX7, at 2-3, Q6, Q11).

215. CX 101 reflects limited expenditures made by PMC in late 1995 and certain expenditures made by PMMC during 1996 and the first quarter of 1997 because there were expenditures incurred by those companies during that overlap period. (McCandless, CX 7 at 3, Q11).

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218. "Litigation" expenditures shown in CX 101 reflect expenditures made in connection with the Weather Channel litigation only, because that is the only prior litigation in which the company has sought to enforce its patents. (McCandless, CX 7, at 3, Q11).

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220. PMC's licensing efforts are directed at its entire patent portfolio which includes all six of the issued U.S. patents in said portfolio. (McCandless, CX7 at 40, Q11; Metzger, Tr at 182).

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222. CX 102 is a chart entitled "PMC LICENSING EXPENDITURES -- LITIGATION, July 1993-March 1997." (CX 102).

223. CX 102 provides the details of the line designated "Litigation" in CX 101. The litigation expenditures reflected in CX 102 relate to the Weather Channel litigation in which three patents (the '825, '414, and '277 Patents) were asserted by PMMC. (CX 102; McCandless, CX 7, at 5, Q15).

224. CX 102 divides the expenses relating to the Weather Channel litigation in two categories: (1) "Legal Fees and Disbursements" which were paid to law firms and (2) "Professional Fees" which were paid to nine expert witnesses or consultants and to one law firm. (CX 102; McCandless, CX 7, at 5, Q15).

225. McCandless was the person responsible for paying all of the expenses reflected in CX 102. CX 102 does not include any expenses incurred by PMC in connection with the instant investigation. (McCandless, CX 7, at 5, Q15).

226. The law firms of Howrey & Simon and Dorsey & Whitney represented PMMC, and later PMC, in the Weather Channel litigation in the Eastern District of Virginia. (McCandless, CX 7, at 5, Q16).

227. The law firms of Butler, Macon, Williams, Pantele and Lowndes, P.C., based in Richmond, Virginia, served as local counsel in that litigation. (McCandless, CX 7, at 5, Q16).

228. The law firms of Holtzman, Urquhart & Moore provided consulting advice and assisted in the settlement of the litigation. (McCandless, CX 7, at 5, Q16).

229. The law firms of Fried, Frank, Harris, Schriver & Jacobson represented H.

Donald Wilson, a past consultant to PMMC, to prepare him for a possible deposition.

(McCandless, CX 7, at 5, Q16).

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236. CX 102 reflects payment by PMMC of professional fees in connection with the Weather Channel litigation to Bernard Lechner; Ellen Ryberg & Associates; Fried, Frank; Gideon Frieder; Jeffrey Krauss; Ronald Williams; Rubin, Bednarek & Associates; Stern Telecommunications Corporation; TeleResources and Tunno & Associates. (McCandless, CX 7, at 6, Q19).

237. Each person or entity listed in the previous finding of fact served as potential testifying witness or consulting expert with respect to the Weather Channel litigation. (McCandless, CX 7, at 6, Q19).

238. CX 102 also reflects payment by PMMC of travel and lodging expenses incurred by PMMC officers and Cuddihy to attend depositions or other activities related to the Weather Channel litigation. (McCandless, CX 7, at 7, Q22).

239. Out-of-pocket travel and lodging expenses reflected in CX 102 were reimbursed by PMMC upon the submission of expense reports substantiating such expenses, which records the company retains. (McCandless, CX 7, at 7, Q22).

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241. McCandless did not attempt to allocate PMC's Weather Channel litigation

expenses based upon efforts that were specifically directed toward the '277 patent.

(McCandless, Tr at 928).

242. McCandless is not personally familiar with the legal documents that were produced by the PMC's attorneys in the course of The Weather Channel litigation or with the legal arguments that were made during that litigation. (McCandless, Tr 929).

243. CX 104 is a chart entitled "PMC Licensing Expenditures -- Professional & Consulting Fees, July 1993-March 1997." (CX 104).

244. CX 104 provides the detail of expenditures shown in the line "Professional & Consulting Fees" in CX 101. (CX 101; CX 104; McCandless, CX 7, at 8, Q26).

245. Bruce Bassett is a consultant listed on CX 104 who was engaged to produce an advanced demonstration videotape for use in licensing activities. (CX 104; McCandless, CX 7, at 8, Q27).

246. Dennis Elliott is a consultant who was engaged to obtain market information and to identify potential licensees. (CX 104; McCandless, CX 7, at 8, Q27).

247. George Harvey is a consultant who was engaged to help the company with computer-related services supporting the licensing business. (CX 104; McCandless, CX 7, at 8, Q27).

248. Gerald Holtzman was engaged to assist the company in licensing its patents and identifying potential licensees. (CX 104; McCandless, CX 7, at 8, Q27).

249. H. Taylor Howard was engaged to identify and assist in discussions with potential licensees. (CX 104; McCandless, CX 7, at 8, Q27).

250. Leslie Sufrin & Co. is the companies' tax accountant who prepares tax returns

and gives tax and accounting advice. (CX 104; McCandless, CX 7, at 8, Q27).

251. MWW Strategic Communications is a public relations firm engaged to provide market information and public relations advice and assistance in support of the licensing business. (CX 104; McCandless, CX 7, at 8, Q27).

252. One Trillion One is a company engaged to assist in developing PMC's web site. (CX 104; McCandless, CX 7, at 8, Q27).

253. Stern Telecommunications Corporation is a consulting firm which provides technical advice about the technology of potential licensees and assists in preparing claim charts. (CX 104; McCandless, CX 7, at 8, Q27).

254. VeriQuest Companies is an organization which supplied a consultant, Jerry Allgood, to identify and contact potential licensees. (CX 104; McCandless, CX 7, at 8, Q27).

255. Video Technologies International is a consulting company which supplied a consultant, Ms. Metzger, to obtain market information about potential licensees and to attend trade shows. (CX 104; McCandless, CX 7, at 8, Q27).

256. Prentice Hall is a company which serves as Delaware agent for PMMC and PMC. (CX 104; McCandless, CX 7, at 8, Q27).

257. Professional fees were generally paid based on invoices submitted for services and reimbursement of out-of-pocket expenses. (CX 104; McCandless, CX 7, at 9, Q28).

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262. There is no duplication of expenses between CX 102 and CX 104. (CX 102; CX 104; McCandless, CX 7, at 10, Q32).

263. CX 106 is entitled "PMC LICENSING EXPENDITURES -- OPERATING EXPENSES, July 1993-March 1997." (CX 106).

264. The expenses reflected in CX 106 are the normal expenses required to operate the company and do not duplicate any of the expenses reflected in CX 102 or CX 104. (CX 106; McCandless, CX 7, at 10, Q34).

265. McCandless testified that although he deducted certain items of overhead and variable expenses which were directly attributable to patent prosecution from the operating expenses shown in CX 106, he attributed most of PMMC and PMC overhead and variable costs to licensing activities because PMMC and PMC's primary business is licensing and exploiting its patent portfolio. (McCandless, CX 7, at 10, Q34). However, PMC's business is actually threefold. (Metzger, Tr 180:21 - 181:2).

266. McCandless testified that, other than its efforts to license its patents portfolio, PMMC and PMC pursued no other products, services or inventions in the marketplace during the period July, 1993 through March, 1997. (McCandless, CX 7, at 10, Q34). However, PMC does actively prosecute its numerous U.S. and foreign patent applications, and also pursues joint venture partners to develop its patents. (Metzger, Tr 180-181, 173-174).

267. CX 106 reflects the attribution of most of PMMC's and PMC's ordinary business expenses to licensing activities. (CX 106; McCandless, CX 7, at 10, Q34).

268. The "Office supplies" reflected in CX 106 include supplies, postage, computer software and similar expenses. (CX 106; McCandless, CX 7, at 11, Q35).

269. The "Repairs and Maintenance" expenses reflected in CX 106 are related to office equipment and PMC's telephone system. (CX 106; McCandless, CX 7, at 11, Q35).

270. The "Payroll Expense" reflected in CX 106 is salary and bonuses paid by PMMC to Caird in 1993-95 and salary and bonus paid by PMC to Christine Balconis (Administrative Assistant) in 1996-7. (CX 106; McCandless, CX 7, at 11, Q35).

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272. "Officer Compensation" reflected in CX 106 represents PMMC's expenses in 1994-5 for medical plan coverage { } and long term disability insurance coverage{ } (CX 106; McCandless, CX 7, at 11, Q35).

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} (McCandless, CX 7, at 11, Q35).

274. The "Deferred Compensation Expense" reflected in CX 106 is the total of payments made in March, 1996 by PMMC to thirteen consultants to or officers of PMMC out of a portion of the proceeds received from settlement of the Weather Channel litigation. (CX 106; McCandless, CX 7, at 11, Q35).

275. McCandless testified that the "Benefit Plans" expenses reflected in CX 106 are expenses by PMMC in 1994-95 for a medical plan and long term disability insurance covering {

} The "Benefit Plans"

expenses reflected in CX 106 also relate to PMC's expenses in 1996 for medical plan premiums and long-term disability insurance. (CX 106; McCandless, CX 7, at 11, Q35).

276. "Meals, Entertainment," "Travel - Other" (meaning not attributable to litigation), "Cabs and Fares" and "Meetings, Conferences" represents those types of costs incurred by PMC personnel in the ordinary course of the company's licensing activities. (CX 106; McCandless, CX 7, at 11, Q35).

277. "Legal Fees: Corporate" reflected in CX 106 are expenses paid to law firms for general corporate matters including securities and out-of-pocket expenses. McCandless testified that such legal fees do not include litigation, patent licensing, patent prosecution, nor the legal fees incurred in connection with the sale of assets from PMMC to PMC. (CX 106; McCandless, CX 7, at 11, Q35).

278. "Secretarial" and "Labor, Services" are payments to temporary workers who are not employees of the companies for general secretarial and clerical work. (CX 106; McCandless, CX 7, at 11, Q35).

279. "Computing Costs" reflected in CX 106 are fees to ADP for payroll processing and consulting services related to new computers which are not included on other exhibits. (CX 106; McCandless, CX 7, at 11, Q35).

280. "Advertising and Promotion" expenses reflected in CX 106 represent payments made to consultants for assistance in issuing press releases and general promotion and marketing advice. (CX 106; McCandless, CX 7, at 11, Q35).

281. The "Other Expenses" reflected in CX 106 were payments related to PMMC's move to a new office in September, 1994. (CX 106; McCandless, CX 7, at 11, Q35).

282. The "Depreciation" expense reflected in CX 106 relates to office equipment, the prototype and PMMC's legal fees associated with negotiating office leases. (CX 106; McCandless, CX 7, at 11, Q35).

283. The "Amortization" expense reflected in CX 106 relates to organizational expenses and PMC's legal fees associated with negotiating office leases. (CX 106; McCandless, CX 7, at 11, Q35).

284. "Interest Expense - Other" reflected in CX 106 is the current expense for the relevant period on a loan to PMMC which was repaid in March, 1994, advances made to the companies for working capital by officers, for delayed reimbursement of out-of-pocket expenses to officers and on the deferred payment of consulting fees to VeriQuest Companies. (CX 106; McCandless, CX 7, at 11, Q35).

285. McCandless testified that CX 106 excludes most of PMMC's and PMC's legal fees. (McCandless, CX 7, at 13, Q36).

286. CX 106 does not include legal fees incurred for licensing activities. (CX 106; McCandless, CX 7, at 13, Q36).

287. CX 106 does not include legal fees incurred in patent prosecution or any out-of-pocket expenses, fees to the patent office or travel expenses of Harvey related to the prosecution of PMC's patent portfolio. (CX 106; McCandless, CX 7, at 13, Q36).

288. CX 106 does not include interest expense paid on the note PMC issued to PMMC for the purchase of the patent portfolio, PMC's amortization expense on the patent portfolio purchased from PMMC, nor legal fees associated with the sale of assets transaction because such transaction was not necessary to continue the licensing business. (CX 106; McCandless, CX 7, at 13, Q36).

289. CX 106 does not include gifts and contributions. (CX 106; McCandless, CX 7, at 13, Q36).

290. McCandless testified that CX 106 does not reflect payment of taxes because most of those expenditures are based on the company's income. (CX 106; McCandless, CX 7, at 13, Q36).

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294. During a portion of the period reflected in CX 106 (from July, 1993 until August, 1994) the '277 Patent was pending before the U.S. Patent and Trademark Office but had not yet issued. (CX 106; CX 3).

295. All of PMC's existing and proposed license agreements make specific reference to all of PMC's pending applications. (See CX 12, Appendix B; CX 15, Schedule A; CX 21, Schedule A; CX 22, at PMC 301418-425; CX 24, at PMC 301478-485; CX 25 at PMC 272717-724).

296. McCandless is aware that PMC's license agreements all specifically reference PMC's pending applications. (See McCandless, Tr at 930-935).

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299. CX 103 is a compilation of documents PMC produced in this investigation which reflect litigation expenses, including examples of legal bills and bills from consultants in the Weather Channel Litigation, as well as documents related to the contingent fee agreement with the attorneys who handled the case for the PMMC, (CX 103; McCandless, CX 7 at 17, Q48), although it does not contain all of the legal invoices which PMC received in connection with the Weather Channel litigation or the contingent fee agreements between PMC and the lawyers retained in connection with the Weather Channel litigation. (McCandless, Tr at 954).

300. CX 105 is a compilation of documents reflecting professional and consultant expenses incurred by PMMC and PMC. (CX 105; McCandless, CX 7 at 17, Q48).

301. CX 107 is a compilation of documents reflecting personnel expenses such as payroll, secretarial, labor and services. (CX 107; McCandless, CX 7, at 17, Q48).

302. CX 108 is a compilation of documents reflecting general overhead expenses. (CX 108; McCandless, CX 7, at 17, Q48).

303. CX 109 is a compilation of documents reflecting utility expenses incurred by the companies. (CX 109; McCandless, CX 7, at 17, Q48).

304. CX 110 is a compilation of documents reflecting miscellaneous expenses incurred by the companies, and includes receipts and invoices for travel, meals and other

categories of expense not reflected in the other compilations. (CX 110; McCandless, CX 7, at 17, Q48).

305. CX 111 is a compilation of state and federal tax filings, (CX 111; McCandless, CX 7, at 17, Q48).

306. CX 117 is a compilation of documents reflecting PMMC and PMC's licensing revenue (CX 117, McCandless, CX 7 at 17, Q48), although it also contains material not reflecting PMC's licensing revenue. (See, CX 117 at PMC 280280-283; 292942).

307. McCandless testified that, although CX 103, 105, 107, 108, 109, 110, 111 and 117 do not represent all of the documents in PMC's possession relating to the expenses detailed in CX 102, 104 and 106, the compilations represent examples of such documents maintained by PMC among its records. (McCandless, CX 7, at 17-18, Q49-Q50).

308. McCandless testified that he is responsible for maintaining the records of PMC that are illustrated in the compilation exhibits CX 103, 105, 107, 108, 109, 110, 111 and 117. (McCandless, CX 7, at 17, Q49).

309. CX 112, 113, 114, 115 and 116 are PMC and PMMC bank account registers provide further backup for all of the expenses set forth in CX 102, 104 and 106 and illustrated by way of example in the compilation exhibits CX 103, 105, 107, 108, 109, 110, 111 and 117, (McCandless, CX 7, at 18, Q51), although not all of PMC's expenses set forth in CX 102, 104 and 106 are delineated in CX 112, 113, 114, 115, and 116. (McCandless, Tr 963-964; 967-968).

310. McCandless testified that every monetary expenditure PMMC and PMC made during the time period July, 1993 through March, 1997 is reflected in the bank registers CX

112, 113, 114, 115 and 116. (McCandless, CX 7, at 18, Q51).

H. Licensing Defense

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312. The agreement of March 2, 1994, between complainant and StarSight provides that the SUBJECT PATENTS include the '501 application which issued as the '277 patent. (RX 18 at 19 and Schedule A thereto; RX 1216 at 19 of the agreement and Schedule A thereto; CX 10 at 19 and Schedule A thereto).

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320. Jonathan Orlick, StarSight's counsel and designated 30(b)(6) witness, answered

at his deposition, when asked if he would agree that StarSight cannot "license rights in the Harvey patents broader than the field of use," "yes." (RX 130, at p. 53).

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323. StarSight has paid PMC for costs incurred in prosecuting patent coverage under the agreement. (RX 31; RX 32 at 3-4; CX 117 at PMC 292944).

324. PMC is in the process of renegotiating the StarSight license. (Metzger, Tr at 182; see, e.g. CX 33).

325. Of particular interest to StarSight during the negotiation of the 1994 agreement was the application that issued as the '277 patent. (Harvey, CX 9 at 12, Q29, Q30).

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334. The agreement of March 2, 1994, between complainant and StarSight is still in effect. (Metzger, Tr 183; Harvey, 1112; RX 1205 at page 50).

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337. On October 16, 1995, a PMMC/StarSight Modification, was executed and is currently in effect. (RX 1212 at 1; CX 11 at 1; Metzger Tr at 190-191; RX 1205 at 50).

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339. The PMMC/StarSight Modification did not modify StarSight's FIELD OF USE granted under the Patent License Agreement between complainant and StarSight dated March 2, 1994. (RX 1212 pages 1-4; CX 11 pages 1-4).

340. The Modification to the Patent License Agreement between StarSight and PMMC, dated October 16, 1995 and having an effective date of October 1, 1995, authorized StarSight to sublicense rights to inventions disclosed in the Subject Patents that fall within the field of use granted to StarSight in 1994. (CX 11, RX 1206 at 2).

341. The PMMC/StarSight Modification authorized StarSight to sublicense rights in the '277 patent to Thomson under the terms and scope substantially the same as shown in

Exhibit A to the PMMC/StarSight Modification. (RX 1212 page 2, CX 11 page 2;

Metzger, Tr 191).

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346. Claims 15, 35, 36 and 37 of the '277 patent read:

15. A method for identifying and selecting television programming in a system that is adapted to direct selected television programming to a television programming output or storage, said system including a processor for receiving and processing at least part of the television programming transmission, a means for transferring said programming selectively from a television programming receiver to a television programming output device or storage device, and a controller for receiving information from said processor and for controlling said means for transferring on the basis of at least some of said information, said method comprising the steps of:

inputting to said controller identification information of at least one specified television program unit;

inputting at least part of a television programming transmission to said processor;

detecting, locating or identifying in said part identification data that

identified a specific television program unit in said transmission; and

inputting information of said data to said controller, determining based on said program unit information that said specific unit is a specific unit and thereby to enable said controller to select at least a portion of said specific television program unit and cause said means for transferring to transfer information of said selected portion to said television programming output device or storage device.

35. A television subscriber station comprising:

a converter for receiving a multichannel television transmission;

a tuner operatively connected to said converter for selecting a specific television channel;

a television receiver or display device for displaying programming of a channel specified by said tuner; and

a controller operatively connected to said tuner for storing information of a selected television program unit and causing said tuner to select a television transmission containing programming of said selected television unit at a specific time.

36. The system of claim 35 also including:

a second controller operatively connected to said television receiver or display device for actuating or tuning said receiver or display device to receive or display the television programming of said selected transmission.

37. The system of claim 35 also including:

a video recorder connected to said converter; and

a second controller operatively connected to said video recorder for causing said recorder to record television programming of said selected transmission.

347. Claims 10 and 12 of the '277 patent read:

10. A television receiver system comprising:

a receiver for receiving a selected portion of a television program

transmission that is not a standard television signal;

a digital detector operatively connected to said receiver for receiver said selected portion and detecting a digital signal;

a storage device operatively connected to said digital detector for receiving detected digital information and assembling said detected information into message units;

a controller operatively connected to said receiver, said detector and said storage device, said controller controlling said receiver to pass selected information to said detector, said detector to pass detected information to said storage device, and said storage device to assemble detected information into message units.

12. A reprogrammable system comprising:

a digital detector for receiving information of a transmission and detecting digital signals in said transmission, said digital signals including new operating instructions;

a processor operatively connected to said digital detector for receiving and processing information of some of said digital signals, said processor identifying those of said operating instructions addressed to said processor, said processor instructing said detector to detect and pass specified signals;

a memory device operatively connected to said processor for holding operating instructions addressed to said processor, said operating instructions controlling the operation of said processor; and

said processor loading said operating instructions that are addressed to said processor into said memory device to thereby reprogram said processor, said operating instructions including instructions to cause said processor to cause said detector to detect different signals.

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350. Ms. Metzger testified that she was involved in the negotiations with Thomson.
(Metzger, Tr 190). However, Ms. Metzger testified:

Q. Are you aware of the terms of the license agreement between Thomson and StarSight that relates top the Harvey rights?

A. I've never seen the Thomson/StarSight agreement.

(Metzger, Tr 3453).

351. The first negotiation held between all three of PMC, StarSight and Thomson of the PMC related aspects of the Thomson/StarSight Agreement occurred in a three-way telephone conference between Ms. Metzger and Messrs. Klosterman and O'Hara in August 1995. (Metzger, Tr 3446).

352. Ms. Metzger was told by Thomson and StarSight officials that Thomson would not enter into a license for the StarSight-owned patents for electronic program guides without PMC also permitting StarSight to sublicense StarSight's rights in the PMC patents to Thomson. (Metzger, Tr 190-191, 3446).

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358. PMC and Thomson have conducted negotiations over the past two years for a full license. (Metzger, Tr at 1991).

359. Metzger has talked to Thomson representatives O'Hara or Meyer 20 to 30 times. There have been several face-to-face meetings. PMC and Thomson representative have also met at trade shows. (Metzger, Tr at 1991).

360. The PMMC/StarSight Modification allowed StarSight to sublicense its full amount of patent rights which StarSight had under complainant's patents to Thomson. (RX1205 at pages 13-14).

361. The modification to the PMC/StarSight agreement{

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362. The PMMC/StarSight Modification is still in effect. (Metzger, Tr 191; RX1205 at page 50).

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368. The October 16, 1995 StarSight/Thomson agreement is still in effect.
(RX1218 at 3).

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I. Feature Films Venture Capital Proposal

373. Richard A. Davidson has a business address of Feature Film Services. He is an independent consultant in computers and electronics . (RX 1006 at 5, 6). Davidson wrote everything in a document titled "Proposed Capital Venture" (RX 1004) except letters over the signatures of other individuals and articles culled from other publications. (RX 1006 at 29). He finalized up through page 10 of RX 1004 in January 1977. Almost all of the remaining portion of RX 1004 was constructed sometime in 1981. (RX 1006 at 92).

374. RX 1004 refers to the development of a system "which encodes and decodes the signals sent by the Pay-TV broadcaster. (RX 1004 at 2). It includes, in addition to the narrative description and abstract of the Feature Films system, several pages of the advantages and capabilities of the system. (RX 1004 at 7-10).

375. The pay TV system that Davidson designed when completed was named FFS-2000. At the conclusion of the design phase of this pay TV system that Davidson worked on for All Star Communications, a decision was made to transfer the rights to that work from All Star to Feature Film Services and when the transfer was made Davidson became a principal in Feature Film Services. (RX 1006 at 25-27).

376. Davidson is the inventor of the U.S. Reissue Patent No. 31,735 (Davidson Reissue Patent), which was assigned to Feature Films. (RX 1010; RX 1006 at 37-38).

377. The Davidson Reissue Patent discloses a system in which a computer could be used to encrypt and a discrete circuit having specific logic could be used to decrypt sound and video for a Pay TV system in a limited broadcast reception area. (RX 1006 at 56-57, 104; RX 1010, col. 5, l. 7 through col. 6, l. 4).

378. Pages 1-10 of RX 1004 describes and extracts from the Davidson Reissue Patent information that is useful for the marketing purpose Feature Film Services was attempting to accomplish. (RX 1006 at 101).

379. The Davidson Reissue Patent is the only U.S. patent owned by Feature Films. (RX 1005 at 36-37).

380. Pages 1 through 10 of RX 1004 probably were given to Davidson's patent attorneys to improve their understanding of the Davidson Reissue Patent. However, the information Davidson provided his patent attorneys for the subject matter of the Davidson Reissue Patent was supplied in early 1977. (RX 1006 at 93).

381. As of 1976-77, the design work for the invention disclosed in the Davidson Reissue Patent was complete and there was no further design work performed in connection with that invention. (RX 1006, at 52-53).

382. Metzger received a copy of the Davidson Reissue Patent in 1991 or 1992, and Metzger sent the patent to Harvey. (Metzger, Tr at 213-14; Harvey, Tr at 1080-81; RX 1010).

383. According to Davidson, the purpose of RX 1004 and the letter which

accompanied it was "to try and get people interested in the encryption device we [Feature Films] had" (RX 1005 at 34) and "to finalize our system and bring it to manufacturing capability." (RX 1001)

384. In 1981, Feature Films distributed RX 1004, on a non-confidential basis, to around 100 companies. (RX 1006 at 31-33).

385. Davidson has no personal knowledge about whether any persons receiving the Venture Capital Proposal packet (RX 1004) actually read all or part of the packet. (RX 1006, at 94, 95).

386. In a letter from Charles Perry of Westinghouse Corp. to Harvey Somach of Feature Films, dated March 17, 1982, Perry writes: "Thank you for your letter and the article on "Proposed Capital Venture." I am sending this material to Mr. James Cuddihy at Teleprompter here in New York for his review." (RX 1002).

387. Somach does not recall receiving RX 1002 but because it was addressed to him, he believes he received it. Davidson, prior to getting ready for his deposition on June 5, 1997 in this investigation, had not seen RX 1002.

388. In March 1982, Cuddihy was working for a Westinghouse Broadcasting Corporation subsidiary -- Teleprompter Corporation -- as Vice President of Engineering. (Cuddihy, Tr at 742, 745).

389. RX 1002 shows that it was copied with attachments to J. Cuddihy.

390. As to RX 1002, Cuddihy testified:

THE WITNESS: This is a letter dated March 17, 1982, to Mr. Harvey Somach of Feature Film Services from Mr. Charles G. Perry III. It is on Group W Company -- excuse me -- Westinghouse Broadcasting Company stationery, and there is a carbon copy to J. Cuddihy and the

carbon copy says there's an attachment.

BY MR. McNETT:

Q What was your relationship to Group W or Westinghouse Broadcasting in March of 1982?

A Westinghouse Broadcasting was basically the parent of Teleprompter, which became at some point Group W Cable and Broadcasting.

Q That was the parent of your employer?

A Yes.

Q At the bottom of the letter where it says "cc J. Cuddihy," were there any other people by the name of J. Cuddihy at Westinghouse that you are aware of?

A Not that I am aware of.

Q Did you receive a copy of this letter in 1982?

A I don't know.

(Cuddihy, Tr at 744).

391. Harvey Somach does not "recall sending anything to Mr. Perry on the 12th of March 1982." (RX 1005 at 61).

392. Davidson testified (RX 1006 at 94-97):

Q. Do you have any information as you sit here today, Mr. Davidson, that any portion of Exhibit 150 [RX 1004] was actually read by any of the companies that you sent it to?

A. No, and I'll give you this reason for that. We did one mass mailing, not several, but one mass mailing. It might have taken place over days, weeks, or even a month. But it was done in one short period of time. So what we sent out, we sent out at that time and not earlier. I had written these pieces for other reasons, assembled them, and finally decided, let's go out and see if we can raise some money in the market because the people we had hoped for and counted on to put money into our venture just did not come through for us.

Q. Was the transmission of this document to Teleprompter part of the mass mailing?

A. Yes, it was.

* * *

Q. Do you know whether something was sent to Mr. Perry on the 12th of March 1982?

A. When you say do I know, I can't say that I remember a mailing going to Mr. Perry on that date, but I'm assuming that he was the recipient of either our mass mailing or he was contacted by someone who did receive one of our mass mailings.

Q. You wouldn't have any information as to what it was Mr. Perry actually had before him when he wrote Exhibit 149 [RX 1002]; isn't that so?

A. Only because it says "article on proposed capital venture," I'm going to believe that he saw or had in front of him what we now refer to as Exhibit 150 [RX 1004].

Q. You don't have any information whether what he actually had was the whole thing though, do you?

A. There's not way I can be sure what he saw or what he referenced, only what I can assume.

393. A letter from Cuddihy to Somach, dated March 22, 1982, states in its entirety: "Mr. Perry has forwarded your March 12th, 1982 correspondence to me regarding program security. I have reviewed the enclosed material and determined that we do not have a specific application for this device in our cable television systems at this time. Thank you for your interest in Teleprompter Corporation." (RX 1003).

394. Davidson testified as to RX 1003 (RX 1006 at 97 to 100):

Q. . . . With respect to Exhibit 151 [RX 1003], I think you previously told me that you have no information as to who James Cuddihy is other than what you've learned in connection with your appearance here today?

- A. That is correct, yes.
- Q. And you don't have any information as to what, if anything, Mr. Cuddihy may have looked at prior to writing Exhibit 151?
- A. Let me understand that question. Are you asking since he says, "I have reviewed the enclosed material and determined that we do not have a specific application for this device," was he looking at Exhibit 150 or was he looking at something else? Are you asking that question?
- Q. Yes.
- A. I'm going to assume he was looking at Exhibit 150 and nothing else just because of the context of his letter and the timing of his letter.
- Q. You don't have any information as to whether he looked at the entirety of Exhibit 150 or whether he looked at perhaps the abstract and the pro formas. You have no information with respect to what, if anything, Mr. Cuddihy may have looked at; is that not so?
- A. No, of course not. I didn't watch him do it. But I will say that Exhibit 150 [RX 1004] was sent in a ring binder with a soft cover and not in parts, but rather in whole, and no other way. So what he had in front of him was the entirety of our proposed venture. What he read of it, I don't know.
- Q. When you say it was sent in a ring binder, you mean like the one I have in front of me?
- A. Yes. In fact, I have an example. That's my personal copy.
- Q. This copy here is your personal copy.
- A. Yes. And all the copies looked just like it except for maybe some scribbling I did at the end.
- Q. Who did the copiers, Mr. Davidson?
- A. An outside printing service. We didn't have a copier adequate to do this job.
- Q. Did anybody from your organization check the pages to make sure they were all there?

A. I can't remember. I took my copy and it looked to be complete so I believe that all copies were similarly complete.

Q. Did you personally attend the mailing out of these copies of Exhibit 150 that went to various individuals in 1981 and '82?

A. I did not personally deliver them to the point of departure, but I saw the assembled collection of envelopes with those proposed venture enclosures stacked up on the floor ready to go to the mailing service before it actually did.

Q. Who actually put the copies in the envelopes and matched them up with the letters?

A. I believe it was the secretary working at All Star Communications under the direction of Mr. Somach.

395. Cuddihy testified as to the Proposed Capital Venture packet. (RX 1004):

A Respondents' Exhibit 1004 is a document entitled "Introduction Proposed Capital Venture." It has the words "Feature Film Incorporated" on it. It has a table of contents, and it goes -- it's about 50 or -- well, it is a rather lengthy document, so I don't know exactly how many pages it is.

Q Do you recall receiving this document?

A No, I don't.

Q Do you have any idea whether or not this document was the enclosure that went with Respondents' Exhibit 1002?

A No, I don't.

* * *

Q I would like to hand to you Respondents' Exhibit 1003 and ask if you could identify that document.

* * *

THE WITNESS: Respondents' Exhibit 1003 is a document on Teleprompter Corporation stationery dated March 22, 1982, to Mr. Harvey Somach of Feature Film Services, and it is signed by me.

BY MR. McNETT:

Q Is that your signature in fact?

A Yes.

Q Do you recall writing this letter?

A No, I don't.

* * *

Q There's a reference here that says you reviewed the enclosed material. Do you have any recollection of reviewing enclosed material that relates to feature film services?

A No, I don't.

Q Do you have any recollection of reviewing any document entitled "Proposed Capital Venture"?

A No, sir.

Q Did you have occasion to review documents of a technical nature that related to developments in cable television in 1982?

A Yes.

Q What were the circumstances surrounding such reviews?

A Basically they were associated with my ongoing responsibilities as vice president of engineering development in the Teleprompter Group W Companies.

(Tr at 746 to 749).

396. Messrs. Harvey and Cuddihy's patent counsel Scott, has no recollection of ever discussing the Venture Capital Proposal (RX 1004) with Messrs. Harvey or Cuddihy prior to 1985. (Scott Tr at 2838).

397. Davidson does not remember whether Teleprompter is one of the companies to

whom the Proposed Capital Venture packet (RX 1004) was sent. (RX 1006 at 34).

398. During the late 1970s and early 1980s, Davidson did not know anybody at Teleprompter. (RX 1006 at 34).

399. At all relevant times continuing to today, Davidson did not and does not know Metzger, and has never met with or spoken to her. (RX 1006 at 35-36).

400. At all relevant times continuing to today, Davidson did not and does not know Cuddihy, and has never met with or spoken with him. (RX 1006 at 35-36).

401. Cuddihy testified (Tr at 742):

Q. Do you recall having any dealings with Feature Film Services Inc.?

A. No, I do not.

402. Davidson has never had a conversation with James Cuddihy. He knows of Cuddihy only through the letter sent to him in 1981, viz. RX 1002. (RX 1006 at 35-36).

403. Somach had not heard of PMC and its predecessor company prior to becoming involved in this investigation. (RX 1005 at 19-20, 50, 57-58, 67).

404. Somach wrote to "Mr." Kazie Metzger on September 25, 1981, while Ms. Metzger was employed at Teleprompter, Inc. (RX 1001).

405. Stomach's 1981 letter to Ms. Metzger specifically mentions a patented innovation which Somach testified was a reference to the Davidson Reissue Patent or the Davidson original patent. (RX 1005 at 36).

406. Ms. Metzger has no recollection of the letter that is RX 1001. (Metzger, Tr at 210).

407. Harvey had no recollection of seeing RX 1001 outside of discovery

proceedings in this investigation. (Harvey, Tr at 1079).

408. Like the Venture Capital Proposal (RX 1004), the Davidson Reissue Patent is directed to a system for encoding and decoding television signals so that they may be viewed only by authorized subscribers. (RX 1010, at col. 1, ll. 17-20).

409. The Davidson Reissue Patent broadcasts a "plurality of unique pulse-coded control signals" that identify individual authorized subscribers and provide information needed to unscramble the video and audio signals. (RX 1010, at col. 2, ll. 52-58).

410. Respondents' expert Stubbs concedes that the system disclosed in the Venture Capital Proposal is "similar in most respects" to the system disclosed in the Davidson Reissue Patent. (Stubbs, Tr at 1196-97).

411. Davidson disagreed with Stubbs' conclusion that the Davidson patent neither suggested nor anticipated a microprocessor but given the limited information Stubbs had, Davidson "could understand how he might have concluded that." (RX 1006 at 100).

J. Importation

412. HNS manufactures in Mexico and imports into the United States DSS receivers for sale in the United States under the brand names Hughes and Memorex. (CX 395 at ¶ 7).

413. Hitachi sells in the United States DSS receivers manufactured in Mexico and imported into the United States by HNS. (CX 395 at ¶ 8).

414. Toshiba sells in the United States DSS receivers manufactured in Mexico and imported into the United States by Thomson. (RX 1713 at ¶ 13).

415. Matsushita sells in the United States, under the brand name Panasonic, DSS receivers manufactured in Mexico and imported into the United States by Thomson. (RX

1713 at ¶ 14).

416. Thomson Consumer Electronics (TCE) manufactures in Mexico and sells in the United States DSS receivers with the following model numbers: DRD001RW, DRD102RW, DRD112NW, DRD203RW, DRD212NW, DRD202RA, DCD302RA, DRD302RA, DRD303RA, DRD403RA, DRD703RA, GRD33G2A, GRD33G3A, NRD313NA, NRD412NA, NRD512NA, and PRD8630A. (CX 40).

417. TCE manufactures in Mexico and imports into the United States DSS receivers for sale in the United States by respondents Toshiba Consumer Products, Inc. having the following model numbers: TSR 101 and TSR 202. (CX 40).

418. TCE manufactures in Mexico and imports into the United States DSS receivers for sale in the United States by respondent Matsushita Electric Corporation of America having the following model numbers: TUIRD10 and TUIRD20. (CX 40). TCE manufactures IRD's for the DSS systems under the brand names RCA, GE, Proscan, Panasonic and Toshiba (Birnbaum, CX 309 at 27).

419. There are three separate satellites that form the DBS system. (Plummer, Tr at 1266; Butterworth, RX 117 at 16-17). {

} (Arsenault, RX 119

at 5-6; Kepley, RX 122A at 4, 7). DIRECTV is an entertainment service provider that gathers programming from various sources, uplinks it to the DBS satellites, which then transmit the programming down to subscribers where they receive it using IRDs. (Butterworth, RX 117 at 20).

420. Respondent DIRECTV's executive vice president James D. Ramo testified as follows:

Q Ms. Lockard, would you hand the witness CX 135.

This is a document that relates to a purchase supply agreement between DIRECTV and Thomson. It is unsigned. It was the copy that was provided to us in discovery, but my question is, is there an agreement between DIRECTV and Thomson whereby DIRECTV purchases DSS receivers from Thomson for resale to the general public?

A There's an agreement between DIRECTV and there is manufacturers with respect to purchasing -- our purchasing of units in order to fulfill our agreement with AT&T, who is a DIRECTV agent.

Q What is your agreement with AT&T that requires DIRECTV to purchase DSS receivers from manufacturers?

A AT&T provides the DIRECTV service as well as the hardware to the consumer, and so we fulfill that on behalf of AT&T, who does not have that capability.

Q Am I correct that AT&T markets DIRECTV through telemarketing?

A Yes, direct sales.

Q And when people sign up for DIRECTV through the AT&T offer, that DIRECTV ships them the receiver?

A Say that again. DIRECTV does --

Q DIRECTV ships the receiver to the customer?

A That's correct.

Q How many DSS receivers have been purchased from Thomson under this program?

A I'm not sure exactly.

Q Do you recall at your deposition you gave a best estimate of about 100,000 units?

A I think that's a best estimate, reasonable best estimate, yes.

(Ramo, Tr at 1505-1506). Similarly, respondent Thomson's Birnbaum testified:

Q Is there an agreement in place between Thomson and DIRECTV whereby Thomson sells IRDs directly to DIRECTV?

A There's no agreement that -- we do sell product. There's no agreement -- we do sell product. There's no agreement.

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Q Was there an agreement prior to now under which Thomson did sell product directly?

A No.

Q Were the products sold to DIRECTV for resale by DIRECTV?

A Yes.

Q Was there a particular brand name under which those products were going to be sold?

A RCA brand.

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Q How was DIRECT -- do you know how DIRECTV went about distributing the RCA products?

A I have a good idea. They sell to AT&T, is one of -- their biggest customer, probably. And they were also planning employee sales, as well as to Hughes, a big organization. And I believe they've also used some product for commercial types of accounts, hotels, restaurants, that they sell directly. And now I know they're beginning to do what they call affinity programs, a type of direct mail types of programs.

Q You say affinity?

A Affinity meaning somebody belongs to some type of -- somebody you group together. So they lump people together. Like American Express. Some affiliation.

Q Are there any other instances other than what you've just testified about where DIRECTV is directly marketing IRDs to the public?

A I really don't know.

Q When you say AT&T, is that a reference to the AT&T consumer electronic retail outlets.

A No -- well, I don't know that. I think they are--sell to the retail outlets. I think they also sell by phone. AT& T sells by phone.

Q Phone solicitation sales?

A Phone solicitation, or through newspapers, whatever. But they do the sale, actual sale by phone.

(Birnbaum, CX 309 at 35-37).

K. DSS Receivers

421. Kepley of respondent HNS testified as follows regarding the operation of the DSS system:

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[Q.] 16. Can you briefly describe the parts or the major components of the Digital Satellite Systems (DSS) subscriber terminal that are present at a customer's location?

[A.] Yes. The DSS subscriber terminal consists of: (1) an outdoor unit, which is an antenna and a low-noise block converter and a feed horn, and a cable to the indoor unit, and (2) an indoor unit which is composed of the IRD as well as the remote control and other cables that go with it.

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(Kepley, RX 122A, at 3-6, Q13-27).

422. Kepley also testified as follows regarding the accused IRDs:

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(Kepley, RX 122A, at 7, Q28).

423. The DSS receiver can be used with a television set, the front end or tuner part of which, according to complainant's Williams, constitutes a television receiver. (Williams, Tr at 466, 480; Schreiber, Tr at 1437, 1607). The DSS system, however, is preferably connected to a monitor or a television set which permits the direct input of S video or a baseband signal. (Schreiber, Tr at 1436-1437).

424. The DSS transmission includes Program Guide information.{

} (RX

119, Arsenault at 8, Q19).

425. {

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426. {

} (RX 119, Arsenault at 16-18, Q39-45).

427. {

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428. Arsenault of DIRECTV, described the implementation of changes as follows:

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(RX 119, Arsenault at 18-20, Q45-48).

429. DIRECTV is an entertainment service provider which gathers programming from various sources, uplinks that programming to satellites and delivers it to people's homes

where the programming is received using Integrated Receiver Decoders ("IRDs").

(Butterworth, RX 117 at 20).

430. DIRECTV maintains facilities and equipment at its Castle Rock Broadcast Center to process programming and transmit it to satellites, as described in RPX1.

(Plummer, RX 120 at 3-4).

431. At the Castle Rock Broadcast Center, DIRECTV receives programming known as "turnarounds" from geosynchronous satellites and by fiberoptic cable. (Plummer, RX 120 at 3-4).

432. {

} (Plummer, RX 120 at 3).

433. {

} (Plummer, RX 120 at 4).

434. {

} (Plummer, RX 120 at 5, 6)

435. {

} (Plummer, RX 120 at 5).

436. {

} (Plummer, RX 120 at 5:8-9)

437. {

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{

} (Plummer, RX

120 at 6).

438. {

} (Plummer, RX 120 at 5, 7).

439. {

} (Plummer, RX 120 at 7).

440. {

} (Plummer, RX 120 at 7).

441. {

} (Plummer, RX 120 at 7).

442. {

} (Plummer, RX 120 at 8).

443. {

} (Plummer, RX 120

at 8).

444. {

} (Plummer, RX 120 at 5).

445. {

} (Plummer, RX 120

at 5).

446. {

} (Plummer, RX 120 at 5).

447. {

} (Plummer, RX 120 at 8-9).

448. {

} (Plummer, RX 120 at 4).

449. {

} (Plummer, RX 120 at 4).

450. {

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{ } (Plummer, RX 120 at 4).

451. The DSS system broadcasts on 32 separate frequencies, each frequency being relayed by a transponder on a satellite. (Arsenault, RX 119 at 5-6).

452. DIRECTV and USSB have a license to 32 frequencies in the KU band at their orbit slot with DIRECTV operating on 27 frequencies, and USSB operating on 5. (Arsenault, RX 119 at 5).

453. {

} (Arsenault, RX 119 at 6).

454. The packets are transmitted on each transponder frequency in a nonsynchronous, non-scheduled multiplexed manner. (Arsenault, RX 119 at 6).

455. {

} (Arsenault, RX 119 at 10).

456. {

} (Arsenault,

RX 119 at 11-12).

457. {

} (Arsenault, RX 119 at 13-14).

458. {

} (Williams, Tr at 418, 449, 475; Klauss Dep., CX 323 at 122-

24; Arsenault, RX 119 at 14, Q35).

459. Respondents' Klauss testified as follows regarding SCIDs:

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(Klauss, CX 323 at 121-125).

460. Respondents' Arsenault testified as follows:

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(Arsenault, RX 119 at 14, Q32-34).

461. {

} (Arsenault, RX 119 at 15, 16).

462. {

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{ }

(Arsenault, RX 119 at 15, 16).

463. {

} (Arsenault, RX 119 at 15, 6).

464. Respondents' DSS subscriber terminal consists of (1) an outdoor unit, which is an antenna and a low-noise block converter and a feed horn, and a cable to the indoor unit, and (2) an indoor unit which is composed of the IRD as well as the remote control and other cables that go with it. (Kepley, RX 122A at 4).

465. {

} (Kepley, RX 122A at 4).

466. {

} (Kepley, RX

122A at 4, 6).

467. {

} (Kepley, RX 122A at

4-5).

468. {

} (Kepley, RX 122A at 5).

469. {

} (W.R. Kepley, RX 122A at 5).

470. {

}

(Kepley, RX 122A at 5-6).

471. {

} (Kepley, RX 122A at 6).

472. Each IRD has an on-screen display ("OSD") feature to allow the user to obtain information about what shows are presently showing, or will be showing, to provide informational messages to the user such as error problems with the unit, and to provide the user with help information. (Kepley, RX 122A at 7-8).

473. Respondents' Kepley testified as follows:

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(Kepley, RX 122A at 8).

474. {

} (Kepley, RX 122A at 8).

475. The on-screen displays for IRDs of the same model have the same capability.

(Kepley, RX 122A at 8).

476. {

} (Kepley, RX 122A at 8).

477. The input electrical signals to the IRD consist of input from the satellite, which is a L-Band signal from the antenna and LNBF, and local antenna input that comes into the IRD and is either routed back out or is terminated in the IRD, and the DSS signal is then routed out of the IRD. (Kepley, RX 122A at 9).

478. No processing of the local antenna signal occurs in the IRD. (Kepley, RX

122A at 9).

479. {

} (Kepley, RX 122A at 9).

480. {

} (Kepley, RX 122A at 9).

481. {

} (Arsenault, RX 119 at 9-10).

482. {

} (Arsenault, RX 119 at 22).

483. {

} (Kepley, RX 122A at 8).

484. {

} (Arsenault, RX 119 at 4).

485. The program guide assists customer navigation by providing a program schedule for each channel which includes start times, durations, program titles, and program descriptions. (Arsenault, RX 119 at 21).

486. {

} (Arsenault,

RX 119 at 4).

487. {

} (Arsenault, RX 119

at 9).

488. {

} (Arsenault, RX 119 at 8,

9).

489. {

} (Arsenault, RX

119 at 8, 9).

490. {

} (Arsenault, RX 119 at 16, 17, 18).

491. {

} (Arsenault, RX 119 at 18).

492. {

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(Arsenault, RX 119 at 19).

493. {

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(Arsenault, RX 119 at 19).

494. {

} (Arsenault, RX 119 at 19-20).

495. {

} (Arsenault, RX 119 at 20).

496. {

} (Arsenault,

RX 119 at 20).

497. {

} (Arsenault, RX 119 at 21).

L. Claim Interpretation

498. The '277 specification under the "Summary of the Invention" reads:

The present invention employs signals embedded in programing. Embedded signals provide several advantages. They cannot become separated inadvertently from the programming and, thereby, inhibit automatic processing. They occur at precise times in programming and can synchronize the operation of receiver station apparatus to the timing of programming transmissions. They can be conveniently monitored.

In the present invention, the embedded signals contain digital information that may include addresses of specific receiver apparatus controlled by the signals and instructions that identify particular functions the signals cause addressed apparatus to perform.

In programming transmissions, given signals may run and repeat, for periods of time, continuously or at regular intervals. Or they may run only occasionally or only once. They may appear in various and varying locations. In television they may appear on one line in the video portion of the transmission such as line 20 of the vertical interval, or on a portion of one line, or on more than one line, and they will probably lie outside the range of the television picture displayed on a normally tuned television set. In television and radio they may appear in a portion of the audio range that is not normally rendered in a form audible to the human ear. In television audio, they are likely to lie between eight and fifteen kilohertz. In broadcast print and data communications transmissions, the signals may accompany conventional print or data programming in the conventional transmission stream but will include instructions that receiver station apparatus are preprogrammed to process that instruct receiver apparatus to separate the signals from the conventional programming and process them differently. In all cases, signals may convey information in discrete words, transmitted at separate times or in separate locations, that receiver apparatus must assemble in order to receive one complete instruction.

(The term "signal unit" hereinafter means one complete signal instruction or information message unit. Examples of signal units are a unique code identifying a programming unit, or a unique purchase order number identifying the proper use of a programming unit, or a general instruction identifying whether a programming unit is to be retransmitted immediately or recorded for delayed transmission. The term "signal word" hereinafter means one full discrete appearance of a signal as embedded at one time in one location on a transmission. Examples of signal words are a string of one or more digital data bits encoded together on a single line of video or sequentially in audio. Such strings may or may not have predetermined data bits to identify the beginnings and ends of words. Signal words may contain parts of signal units, whole

signal units, or groups of partial or whole signal units or combinations.)

(CX 2, '277 patent, col. 9, ln 48 - col. 10, ln. 33).

499. "Control signals" are specifically referred to in claims 1, 2 and 3 of the '277 patent (CX 2, col. 310, line 45, col. 311, lines 1 and 23).

500. The '490 patent describes an example under the heading "Co-ordinating Print and Video" the following example:

Suppose a viewer watches a television program on cooking techniques that is received on TV set, 202, via box, 201. Julia Childs's "The French Chef" is one such program. Halfway through the program, the host says, "If you are interested in cooking what we are preparing here and want a printed copy of the recipe for a charge of only 10 cents, press 567 on your Widget Signal Generator and Local Input." The viewer then presses buttons 567 on local input, 225, which signal is conveyed to the buffer/comparator, 8 (referring to FIG. 1), of signal processor, 200, to hold and process further in a predetermined fashion. Five minutes later, a signal is identified in the incoming programming on TV set, 202, by decoder, 203, which is also transferred by processor, 204, to buffer/comparator, 8, of signal processor, 200. This signal instructs buffer/comparator, 8, that, if 567 has been received from signal generator, 225, signal processor, 200, should, in a predetermined fashion, instruct tuner, 223, to tune cable converter box, 222, to the appropriate channel to receive the recipe in encoded digital form and instruct control means, 226, to activate printer, 221. The signal transmission from processor, 204, also passes a signal word to signal processor, 200, which decrypts and transfers to decrypter, 224, to serve as the code upon which decrypter, 224, will decrypt the incoming encrypted recipe. Then, as part of the predetermined operation, signal processor, 200, conveys to its data recorder, 16, information that the 567 order was placed by the viewer and all necessary equipment was enabled. When the transmission of the recipe is received, box 222, transfers the transmission to decrypter, 224, for decryption and thence to printer, 221, for printing. Other signal decoder, 227, identifies a signal in the transmission received by printer, 221, which it passes via processor, 228, and buffer/comparator, 14, of signal processor, 200, to data recorder, 16. This signal indicates that the recipe, itself, has been received. Subsequently, when signal processor, 200, transfers the data in its data recorder, 16, via telephone to a remote site, that site can determine for billing purposes that the recipe was, first, ordered and, second, delivered.

(An alternate method for transmitting the recipe to printer, 221, would be for the recipe, itself, to be located in encoded digital form in the programming transmission received by TV set, 202. In this case, decoder, 203, would

identify the signals conveying the recipe and transfer then via processor, 204, to signal processor, 200, which would decrypt them, itself, and transfer then, via means which in this case it would have, to printer, 221.)

(CX 3, '490 patent, col. 20, ln. 16-68).

501. The '490 patent describes systems for "monitoring reception and operation which methods can be used to gather statistics on programing usage and associated uses of other data transmissions and equipment," including television program ratings. CX 3, col. 15, lines 26-31; see generally CX 3, col. 15, line 26 to col. 17, line 33.

502. The '277 patent describes signals embedded in a television transmission which are not "SPAM" messages. Specifically, the '277 patent reads:

In due course, but still before said 8:30 PM time, said program originating studio embeds in the video portion and transmits particular SPAM check information that is not a SPAM message and consists only of a particular check sequence of binary information followed by an end of file signal. (Hereinafter said SPAM check information is called the "1st-WSW-decryption-check (#7).") Then said program originating studio ceases transmitting a television signal of digital video and digital audio.

Receiving the binary information of said check sequence at decoder, 30, causes digital detector, 38, to detect said information and causes control processor, 39J, to record said information at the RAM associated with said control processor, 39J, in the aforementioned predetermined fashion. Then receiving said end of file signal of EOFs-signal-detected information to control processor, 39J, thereby causing said processor, 39J, to transmit a particular check-data-loaded signal to controller, 20, in the aforementioned predetermined fashion.

Receiving said check-data-loaded signal causes controller, 20, under control of said 1st-stage-enable-WSW-program instructions, to cause the control processor, 39J, of decoder, 30, to transfer to controller, 20, selected information of said check sequence of binary information and compare said selected information to selected information of said 1st-stage-enable-WSW-program instructions. A match occurs at the station of FIG. 4, indicating that decryptor, 224, is decrypting its received information correctly.

(Simultaneously other stations compare selected information of said check sequence to selected information of 1st-stage-enable-WSW-program instructions. At each station where a match fails to occur -- which indicates

that a decryptor, 224, is not decrypting its information correctly and suggests that the preprogrammed SPAM operating information of said station may have been tampered with -- not resulting in a match causes the controller, 20, of said station to cause all information of said 1st-WSW-program-enabling-message (#7) to be erased from all memory of said station except for a particular portion of said 1st-stage-enable-WSW-program instruction loaded at the RAM of said controller, 20, then to execute the information of said portion as instructions of a machine language job. Executing said portion causes controller, 20, to cause the auto dialer, 24, and telephone connection, 22, of said station to establish telephone communications with a particular predetermined remote station, in the fashion described above, and causes controller, 20, then to transmit the aforementioned appearance-of-tampering information together with complete information of the unique digital code that identifies said station uniquely. If telephone communications are not established with said remote station in a predetermined fashion and/or within a predetermined time interval, the instructions of said portion cause said controller, 20, to erase all preprogrammable RAM and EPROM of the signal processing apparatus at said station, thereby disabling said apparatus.)

Resulting in a match causes controller, 20, to execute a particular portion of said 1st-stage-enable-WSW-program instructions.

(CX 2, col. 168, ln. 39 - col. 169, ln. 54).

503. The specification of the '277 patent, under the heading "Introduction to the Signals of the Integrated System" reads as follows:

The signals of the present invention are the modalities whereby stations that originate programming transmission control the handling, generating, and displaying of programming at subscriber stations.

(The term, "SPAM," is used, hereinafter, to refer to signal processing apparatus and methods of the present invention.)

(CX 2, col. 24, lns. 35-41).

504. The '277 patent specification contains the following description of the "information SPAM signals:"

The information of SPAM signals includes data, computer program instructions, and commands. Data and program instructions are often recorded in computer memories at subscriber stations for deferred execution. Commands are generally for immediate execution and often execute computer programs or control steps in programs already in process. Often said data,

programs, and commands control subscriber station apparatus that automatically handle, decrypt, transmit, and/or present program units of conventional television, radio, and other media.

(CX 2, col. 25, lns. 7-17).

505. Respondents' expert, Dr. Schreiber, testified regarding "predetermined signals" as follows:

Q All right. So, with that prefatory statement, how did you understand the term "a predetermined signal"?

A The word "predetermined" is used in the patent so many times I couldn't count it, but I don't think "predetermined signal" is used, or at least if it is used, it is not well defined. However, I have a working opinion that what it refers to is the digital data that is embedded in the analog television program for some control or instruction purposes at the receiver.

Q Does the patent specification speak of imbedding spatial data in an analog transmission system?

A Oh, yes. In fact, the word "embedment" is used quite a bit and examples are given of where you might embed the signal, mainly in the vertical blanking interval. But at some -- some mention is made of using the audio signal or inputting the signal in some place where we would be either, where it would be either invisible or inaudible. And then in figure 2A there is mention of imbedding a signal somewhere else. But that somewhere else is not defined except to be different from the ones I had already mentioned. But nevertheless I thought "predetermined signal" referred to that embedded signal.

(Schreiber, Tr at 1396) (emphasis added).

506. The '277 specification contains the following description under the heading "The Composition of Signal Information . . . Commands, Information Segments [sic], and Padding Bits" in relation to "SPAM signals:"

SPAM signals contain binary information of the sort well know [sic] in the art.
...

* * *

FIG 2E shows one example of the composition of signal information (excluding bit information required for error detection and correction). The information in FIG 2E commences with a header which is particular binary information that synchronizes all subscriber station apparatus in the analysis of the information pattern that follows. Following said header are three segments: an execution segment, a meter-monitor segment, and an information segment. As FIG. 2E shows, the header and execution and meter-monitor segments constitute a command.

A command is an instance of signal information that is addressed to particular subscriber station apparatus and that causes said apparatus to perform a particular function or functions. A command is always constituted of at least a header and an execution segment. With respect to any given command, its execution segment contains information that specific apparatus that said command addresses and specifies a particular function or functions that said common causes said apparatus to perform. (Hereinafter, functions that execution segment information causes subscriber station apparatus to perform are called "controlled functions").

(CX 2, '277 patent col. 26, lns. 37-59).

507. The '277 patent provides, with respect to information segments:

Information segments follow commands and can be of any length. Program instruction sets, intermediate generation sets, other computer program information, and data (all of which are organized in a fashion or fashions well known in the art) are transmitted in information segments. An information segment can transmit any information that a processor can process. It can transmit compiled machine language code or assembly language code or higher level language programs, all of which are well known in the art. Commands can execute such program information and cause compiling prior to execution.

(CX 2, col. 31, lines 28-39).

508. The '277 patent describes the following as "examples of addressed apparatus:"

Execution segment' information includes the subscriber station apparatus that the command of said segment addresses and the controlled functions said apparatus is to perform. ("ITS" refers, hereinafter, to intermediate transmission station apparatus, and "URS" refers to ultimate receiver station apparatus.) Examples of addressed apparatus include:

- ITS signal processors (in 71 in FIG. 6);
- ITS controller/computers (73 in FIG. 6);
- URS signal processors (200 in FIG. 7);
- URS microcomputers (205 in FIG. 7);

URS printers (221 in FIG. 7), and
URS utilities meters (262 in FIG. 7).

(CX 2, col. 27, lns. 24-31). The '277 specification discloses the following "Examples of controlled functions:"

Load and run the contents of the information segment;

Decrypt the execution segment using decryption key G;

Decrypt the execution and meter-monitor segments using decryption key J.

Commence the video overlay combining designated in the meter-monitor segment;

Modify the execution segment to instruct URS microcomputer, 205, to commence overlay designated in meter-monitor segment, record the contents of the execution and meter-monitor segments; and transfer command to URS microcomputer 205;

Print the contents of the information segment;

Record the contents of the execution and meter-monitor segments; transfer them to URS decryptors 224, and execute the reprogrammed instructions that cause URS decryptors, 224, to commence decrypting with said contents as decryption key; execute preprogrammed instructions that cause URS cable converter boxes, 222, to switch to cable channel Z; execute preprogrammed instructions that cause URS matrix switches, 258, to configure its switches to transfer the input from converter boxes, 222, to decryptors, 224, and the output from decryptors, 224, to microcomputers, 205; modify the execution segment to instruct URS microcomputers, 205, to commence loading and executing the information received from URS decryptors, 224 via URS switches, 258.

(CX 2, col. 27, lns. 32-63) (emphasis added). Thus, one specifically enumerated example of a "controlled function" is to "[p]rint the contents of the information segment." (CX 2, col. 27, line 47).

509. The '277 patent contains an example titled "Automating U.R. Stations . . . Examples #9 and #10 Continued Coordinating Computers, Television, and Print," (CX 2, col. 261, lns. 33-35) (emphasis in original), related to a television program on Indian

cooking ("Exotic Meals of India"). (See generally CX 2, col. 261, line 36 to col. 266, ln.

36). In the "Exotic Meals of India" example of the '277 patent, the specification teaches that:

The microcomputer, 205, of the station of FIG. 7 and 7F, is preprogrammed to receive and process automatically meal recipe instructions and holds records of the size of the family of the subscriber of said station together with the tastes and dietary habits of the members of said family. For example, particular information is recorded in a file named DATA_OF_URS that is on a so-called "floppy disk" that is loaded in the A: disk drive at said microcomputer, 205. Said information specifies that said family prefers particular very hot and spicy foods, prefers to minimize salt consumption, and consists of four adults.

(Simultaneously, a particular second microcomputer, 205, that is at the different station of a second subscriber and is also preprogrammed to receive and process automatically meal recipe instructions, holds information in a file named DATA_OF_URS on a floppy disk that is loaded at its A: disk drive which information specifies that the family of said second subscriber prefers particular mild foods, is indifferent regarding salt consumption, and consists of two adults.

The specification further teaches regarding a "SPAM message" that contains, inter alia, an "information segment of particular generate-recipe-and-shopping-list instructions:"

[S]aid program originating studio embeds in the transmission of said "Exotic Meals of India" programming and transmits a particular second SPAM message that consists of an "01" header, particular execution segment information that is identical to said covert control information, appropriate meter-monitor information including unit code identification information that identifies the programming of the information segment of said message, padding bits as required, information segment of particular generate-recipe-and-shopping-list instructions, and an end of file signal.

(CX 2 at col. 263 - col. 264, ln. 55).

510. The '277 specification further teaches regarding "conventional television programming:"

(In other words, because said "Exotic Meals of India" programming is conventional television programming rather than combined medium programming, no information of said programming is inputted to

microcomputer, 205, and no programming outputted by microcomputer, 205, is inputted to monitor, 202M.)

(CX 2, col. 262, lns. 27-32).

511. The '277 specification contains another example of SPAM signals under the heading "Automating U.R. Stations . . . Receiving Selected Programming" related to a "particular AT&T news item" (See generally CX 2, col. 234, ln. 18- col. 238, ln. 16)(ellipsis in original). Specifically, the '277 patent specification teaches:

The microprocessor, 205, of the station of FIG. 7 and 7C, is preprogrammed to hold records of a portfolio of stocks and to receive and process automatically news items about said stocks and about the industries of said stocks. The signal processor, 200, of said station is preprogrammed at the RA/4 associated with the control processor, 39J, of the controller, 39, of its decoder, 30, with particular news-items-of-interest information that includes identification information of the particular stocks in said portfolio and at its controller, 30, with particular cause-selection instructions that control said controller, 20, in selecting transmissions of news items of interest.

One company whose stock is preprogrammed at said microprocessor, 205, is the American Telephone and Telegraph Company whose stock is identified by particular binary information of "T". And among the news-items-of-interest information at said RAM is an instance of said binary information of "T".

The specification further teaches:

In due course, said remote news-service-A station transmits a particular AT&T news item in a particular Transmit-AT&T-News-Item message that is in said Transmit-News-Item SPAM message format and that consists of an "01" header, an execution segment of particular transmit-news-message information that is addressed to ITS computers, 73, a meter monitoring segment that contains the 'program unit identification code' information of said AT&T news item and subject matter information of said binary information of "T", appropriate padding bits, an information segment [sic] that contains said AT&T news item, and an end of file signal.

* * *

And said Specific-AT&T-News-Item message is in said Specific-Digital-News-Item message format consists of an "01" header; an execution segment of particular process-news-item information that is addressed to US microcomputers, 73; a meter-monitor segment that is identical to the meter-

monitor segment of said Select-AT&T-News-Item message; appropriate padding bits; an information segments that contains the information of said AT&T news item; and an end of file signal.

(CX 2, '277 patent at col. 234, ln. 65- col. 235, ln. 8, lns. 42-51).

The '277 specification further teaches regarding "said AT&T news item:"

In due course, said Specific-AT&T-News-Item message is transmitted on said channel A.

Transmitting said message causes decoder, 290, to detect and input said message to the controller, 39, of said decoder, 290.

Receiving said message causes said controller, 39, to cause microcomputer, 205, to process information of said message. Automatically, controller, 39, executes the instructions of a particular preprogrammed controlled function and inputs to an input buffer of microcomputer, 205, a particular input-from-290 computer job that consists of process-this-data-input-from-290 instructions and particular data. Said data includes the meter-monitor information of said message and the information of the information segment of said message -- that is, said AT&T news item.

In due course and in a predetermined fashion, microcomputer, 205, processes said job; determines that the preprogrammed instructions entered by the subscriber of the station of FIG. 7 and 7C are to print at printer, 221, data of any job of process-this-data-input-from-290 instructions; and causes said AT&T news item to be printed at said printer, 221.

(CX 2, '277 patent, col. 237, lns. 19-41).

512. Examples #9 and #10, are described in the '277 specification as follows: An example #9, that focuses on generating, embedding, and transmitting combined medium program instruction set programming of unit Q to the station of FIG. 6 illustrates automating intermediate station combined medium operations.

One minute later, said program originating studio embeds in the transmission of said "Exotic Meals of India" programming and transmits a particular second SPAM message that consists of an "01" header, particular execution segment information that is identical to said covert control information, appropriate meter-monitor information including unit code identification information that identifies the programming of the information segment of said message, padding bits as required, information segment of particular generate-recipe-and-shopping-list instructions, and an end of file signal.

513. The '277 patent teaches as follows regarding the "normal transmission location for SPAM signals" in "broadcast print or data communications:"

In broadcast print or data communications, the preferred normal transmission location for SPAM signals is in the same location as the conventional information. More precisely, conventional print or data information is transmitted in SPAM transmissions. Any given instance of conventional print or data information is transmitted in a SPAM information segment that is preceded by a "01" header SPAM command or a "11" header, which command or header addresses conventional print or data processing apparatus at subscribers stations and causes said apparatus to process said conventional information in the conventional fashion. In said transmission, other SPAM commands and information address and control subscriber station apparatus in other SPAM functioning.

(Hereinafter, the preferred normal location for transmitting signals in any given communication medium is called, the "normal transmission location".)

In the preferred embodiment, while receiver station decoder apparatus may be controlled, in fashions described below, to detect information segment information outside the normal transmission locations, SPAM commands and cadence information are always transmitted in normal transmission locations. In the present invention, the object of many decoders is to detect only command information such as meter-monitor segment information. Having one unchanging location for the transmission of command information in any given television, radio, broadcast print, or data transmission permits decoder apparatus to search just one unchanging portion of said transmission to detect commands. Having the same fixed location for cadence information enables said decoder apparatus to distinguish all command information in said transmission.

(CX 2, '277 patent at col. 49, lns. 13-46).

514. The '277 specification teaches that

In signal processing, flexibility of message structure is also of critical importance. The single, unified system of the present invention must have capacity for communicating to many different apparatus messages that vary greatly in complexity, length, and priority for speed of processing. By providing first priority segment capacity -- in the simplest preferred embodiment, execution segments -- that is short, rigid in format, and can communicate information to many different addressed apparatus, the preferred embodiment provides capacity to communicate a select number of high priority control messages to many alternate apparatus in the fastest possible

time. By providing intermediate priority segment capacity -- in the simplest preferred embodiment, meter-monitor segments -- that is flexible in length, formate, and information content, the preferred embodiment provides more flexible capacity to communicate control messages of slightly lower priority. By providing lowest priority segment capacity -- in the simplest preferred embodiment, information segments -- that can contain any binary information and be any length, the preferred embodiment provides complete flexibility to communicate any message that can be represented in digital information to any apparatus at the lowest processing priority.

(CX 2, '277 patent, col. 33, lns. 8-32, and Fig. 2E).

515. The '277 specification also provides:

The information of SPAM signals includes data, computer program instructions, and commands. Data and program instructions are often recorded in computer memories at subscriber stations for deferred execution. Commands are generally for immediate execution and often execute computer programs or control steps in programs already in process. Often said data, programs, and commands control subscriber station apparatus that automatically handle, decrypt, transmit, and/or present program units of conventional television, radio, and other media.

In combined medium communications, SPAM signals also control subscriber station apparatus in the generating and combining of combined medium programming. At ultimate receiver stations, particular combined medium commands and computer programs cause computers to generate user specific programming and display said programming at television sets, speaker systems, printers, and other apparatus. (Hereinafter, instances of computer program information that cause ultimate receiver station apparatus to generate and display user specific information are called "program instruction sets.") At intermediate transmission stations, other commands and computer programs cause computers to generate and transmit program instruction sets. (Hereinafter, instances of computer program information that cause intermediate transmission station apparatus to generate program instruction set information and/or command information are called "intermediate generation sets.")

In combined medium communications, particular SPAM commands control the execution of intermediate generation sets and program instruction sets and the transmission and display of information generated by said sets. Whether said commands control apparatus at intermediate transmission stations, ultimate receiver stations, or both, the function of said commands is to control and synchronize disparate apparatus efficiently in the display of combined medium programming at ultimate receiver stations. (Accordingly, all said commands are called "combining synch commands" in this specification.) Most often,

combining synch commands synchronize steps of simultaneous generating of station specific information at pluralities of stations and/or steps of simultaneous combining at pluralities of stations (which steps of combining are, more specifically, steps of simultaneous transmitting at each station of said pluralities of separate information into combined transmissions), all of which steps are timed to control simultaneous display of user specific combined medium information at each station of pluralities of ultimate receiver stations.

The present invention provides a unified signal system for addressing, controlling, and coordinating all said stations and apparatus. One objective of said system is to control diverse apparatus in in the speediest and most efficient fashions. A second objective is to communicate control information in forms that have great flexibility as regards information content capacity. A third objective is to communicate information in compact forms, thereby maximizing the capacity of any given transmission means to communicate signal information.

Yet another objective is expandability. As the operating capacities of computer hardware have grown in recent decades, increasingly sophisticated software systems have been developed to operate computers. Often incompatibilities have existed between newly developed operating system software and older generations of computer hardware. It is the objective of the system of signal composition of the present invention to have capacity for expanding to accommodate newly developed subscriber station hardware while still serving older hardware generations. In practice this means that the unified system of signals does not consist, at any one time, of one fixed and immutable version of signal composition. Rather it is a family of compatible versions.

(CX 2, '277 patent at col. 25 ln. 7 - col. 26, ln. 16).

516. Complainant's Williams testified as follows regarding "digital detector":

Q In your mind, is there an implementation that you would immediately think of when given the task of, even at a functional block level, designing a digital detector without knowing all the other details that goes with it?

A You mean like a single universal digital detector that would be capable of detecting all things digital? If that's what you mean, then no.

Q If I tell you, consider yourself of ordinary skill in the art, a person with an electrical engineering degree, several years of experience in a field, that you need to design a system, and one of the parts of that system is the digital detector, is it your testimony that you need a lot more information before you even have an idea of what functional blocks go

into the digital detector?

- A It would be just like building a demodulator. I would need to know what the demodulation is like in order to build a demodulator. Likewise, a digital detector detects digital information, but I need to know detecting what in order for me to build the device.
- Q There's no way of knowing what; by virtue of me telling you digital detector, you can't determine at least some understanding of what the input or output would be?
- A Again, it's like talking about a demodulator. If you say that and don't tell me what kind of signal I'm dealing with, then no, I don't know what characteristics of the input are going to be. In the case of the digital detector, unless I know how the digital information is placed on the input, I'm not going to know how to take it off.
- Q If you say demodulator, you've got a signal, and there must be some other signal that's being carried by the first signal?
- A Sure.
- Q That's understood when you say demodulator?
- A There are different forms of modulation, different ways that information could be placed on that carrier.
- Q My question to you is if I say digital detector, you can't even tell me, at least I know that the input is going to be something like this, like a modulated signal?
- A That would certainly be one reasonable option. I wouldn't know that for certainty, but that would certainly be one reasonable option.
- Q The input to a demodulator is going to be a modulated signal; correct?
- A In some way, I'm going to have information on a carrier, for example.
- Q There's no similar limitation for an input to a digital detector?
- A If we pull the detector away from the claims, away from the example, I'd have to agree with you.

(Williams, Tr at 3065 - 3068).

517. Respondents' Stubbs testified as follows regarding the "digital detector" of the

'277 patent:

Q Tell me what in that part that you just read suggests to you that there is going on here the step of detecting control signals.

A To the extent there's a separate digital control signal and the broadcast signal, for it to be useful at a receive site, I don't know how it could be made useful without going through the step of detection.

Q How would someone know, though, that that signal had to be detected and how would they know how to do it?

A I would say that to anybody working in the field at that time, it would be clear that if such a control signal is in the broadcast signal, then that receive location, a detection process would have to occur to cause the control signal to be usable. Since the venture capital document doesn't get into the details of the modulation process, that's as far as you can go from the venture capital document.

Q Would a person of ordinary skill in the art in 1977 have known how to strip a digital signal out of a carrier transmission and detect it and produce a string of bits?

A Yes.

* * *

Q It would be hard to design the system if you don't know a little bit about how the transmitter was setting up the codes and setting up the modulation?

A Correct.

Q Alternatively, if you did know that, it's pretty routine engineering to build the system?

A Yes.

Q The logic that manages the outer network 136 and the shift register and the dertype flip-flop, the ROM down here, the comparator function -- by the way, tell us what the term "comparator" would mean to someone in the digital arts in 1977?

A It would mean comparing two digital sequences to determine whether they were identical or not.

(Stubbs, Tr at 1185:5 - 1186:1, 1211).

518. Respondents" Schreiber testified as follows regarding the phrase "digital detector:"

Q With respect to the digital detector operatively connected to a mass-medium receiver, Dr. Schreiber, it's a fact, isn't it, that the term 'digital detector,' as it's used throughout this patent, is fairly clearly intended to be a reference to a circuit for extracting a digital string of bits from an analog signal?

A That's right.

* * *

A From a particular analog signal, a baseband video signal.

(Schreiber, Tr at 1610). Schreiber also testified:

Q Okay. Moving to the first element that appears at lines 36 to 39, it speaks of a digital detector for receiving said transmission and detecting said predetermined signal in said transmission based on either a specific location or a specific time.

What understanding do you have of the term "digital detector"?

A From looking at figure 2A and the explanation in the patent about how it works, the purpose of the digital detector is to extract the digital data that has been embedded.

Q Does the term "digital detector" -- let me put it this way. When did you first look at the '277 patent?

A February, I think.

Q Prior to February did the term "digital detector" have any particular meaning to you?

A It certainly doesn't describe any specific circuit, for example. Now, I am in the business of communicating digital signals. It has come up in the case of high definition television, which is a digital system, and the manner in which the digital information is modulated on to the carrier and the manner in which it is demodulated at the receiver to get back to the digital data stream that goes in the encoder at the transmitter has been a subject of active investigation and R&D in the U.S. for the last

-- in connection with the HDTV process since 1987. More than 10 years now. And we don't normally talk of digital detectors in this business. We talk of demodulators, the purpose of which is to extract the digital modulation, the digital information that was modulated on to the carrier. And these turn out to be very complicated. They depend very much on exactly what modulation method is used, of course. But they also depend on what transmission conditions under which you still expect to get adequate error performance in the system, how much noise, how much ghosts, et cetera, et cetera. So, although given a particular problem, a person skilled in the art of digital communications could certainly define something that performed the function of the device here called the digital detector, the patent doesn't tell you anything that would do that.

* * *

Q In 1981 did the phrase -- well, let me back up. If you or others of ordinary skill in 1981 constructed such a circuit for detecting digital information, would you all design the same circuit?

A Probably not.

Q Would there be many different circuits that could accomplish that function?

A Yes.

Q Would the term "digital detector" as it -- if it were used in 1981 -- have designated any particular one of those circuits?

A No, it wouldn't.

* * *

JUDGE LUCKERN: Isn't the term "digital detector" something that's knowledgeable to people in this art?

THE WITNESS: In my opinion, the term "digital detector" has never had a specific meaning. Now, it's obvious that it has something to do with detection. It has something to do with digits. But it certainly doesn't convey a structure, and in the case of this patent, if you look at the claims as well as the specification, it's not at all clear what the function of the digital detector is.

* * *

JUDGE LUCKERN: Again, it's my stupidity at the present time. I won't have that when I issue my ID, but you said at page 215, line 20, "in my opinion, the term 'digital detector' has never had a specific meaning."

Of course, claim 44 does have the phrase "digital detector," that's at column 323, line 40, but are you saying that a man skilled in this art, if you use the term, forget the patent, if you use the term "digital detector," are you saying that that would not have any specific meaning to a man skilled in the art, or are you saying here in this patent, the term "digital detector" that's at column 323, line 49, that that term doesn't have a specific meaning in the patent specification? Do you understand what I'm trying to ask you?

THE WITNESS: Yes, I think I do. Independent of the patent and this lawsuit, in my opinion, the term "digital detector" never specified ever a particular function or a particular circuit.

In connection with the patent, we can deduce, to some extent, what the digital detector is supposed to do. We look at figure 2A, for example. There is clearly labeled the digital detector, and we can tell from this diagram what the input is. As we see in the -- on the TV, this is the input to the digital detector, and it comes out of the amplitude demodulator. Therefore, the signal that goes into digital detector number 38 is a baseband video signal, and that is not the case in RX 353. The signal that comes into the so-called digital detector is, in fact, a multicarrier signal with the data stream from each transponder on a separate carrier, and that's not a baseband video signal.

(Schreiber, Tr at 1415-1416, Tr at 1417, Tr at 1538-1539, Tr at 1541-1542).

519. [There is no Finding 519]

520. [There is no finding 520]

521. The term "tuner" refers to a component that selects a position of an incoming mix of frequencies and sends that portion on to the next component. (Schreiber, Tr 1580-83).

522. Respondents' Schreiber testified as follows regarding the phrase "demodulator:"

Q Is it accurate to say that both the video baseband will be coming out of the tuner and demodulator in the television receiver plus the audio?

A The audio has to come out also.

Q And that will then have to go up to be further demodulated; right?

A Well, it might be demodulated in the tuner.

Q It would be a different kind of demodulation than is involved in simply removing the carrier of the video baseband signal?

A Yes, it's frequency modulated. You have to use a frequency to demodulate it.

Q This 4.5 megahertz is the audio subcarrier?

A Sometimes, yeah.

JUDGE LUCKERN: And Mr. Taylor had written in a little box "demodulator," didn't you, Mr. Taylor?

MR. TAYLOR: I have written in little box above here, and I'll call it audio, your Honor.

JUDGE LUCKERN: I can't read the word. My eyes are not that good.

MR. TAYLOR: "Audio" above and "demod" in the box.

BY MR. TAYLOR:

Q The output, whether you put this demodulator in the tuner or whether you have it out in a separate box, its purpose is to remove the 4-1/2 megahertz carrier and leave an audio signal?

A That's right.

Q And that audio signal can be fed perhaps through an amplifier or speaker or some kind of an audio device?

A Even two speakers.

Q Even two speakers. And the baseband signal then goes, and it actually controls the brightness of that scan that you've described today as sweeping back and forth across the screen?

- A Right, and if we're talking about color signals, it controls the brightness of the red, green and blue aspects of the picture.
- Q And it carries the necessary sync signals so that the line that goes across the screen of the television set corresponds to the line that started the signal in the first place at the camera?
- A That's right.
- Q A lot of manufacturers have begun putting a little connector on the back of the box to allow the user to, instead of using the tuner plus demodulator, to put a video baseband signal in from some source other than the antenna; is that not right?
- A That's right. It's required by law in France and maybe some other European countries. I wish we had that law here.
- Q But, in fact, a lot of American manufacturers are doing it today, aren't they?
- A Well, some are. I don't know the statistics.

(Schreiber, Tr at 1594:22 - 1596:24).

523. A base band video signal, as defined by the spectrum of the NTSC video signal, extends from zero frequency up to about 4.2 Mhz. The chrominance is inside the luminance band width and the audio carrier is up on the top. The overall band width of an NTSC video base band signal is 6 Mhz. (Schreiber, Tr at 1522:19 - 1523:6)

524. Complainant's Williams testified:

- Q. Looking at path B, as it's coming down from -- Dr. Williams, isn't it true that the input along all of those paths, path A, path B and path C would be a television baseband signal?
- A. Well, yes, with the addition of embedded signals possibly.

(R. Williams, Tr at 547).

525. Inventor Harvey did not believe that any specific circuitry needed to be disclosed showing implementation of the digital detector function. (RX 123 at 845)

526. Harvey had no structure in mind for implementing any of the digital detectors shown in the 1981 or 1987 applications. (RX 123 at 838)

527. According to Harvey, any device that detects digital information is a digital detector. (RX 123 at 93)

528. Harvey did not intend to limit in any way the structure that would be used for performing the digital detector function. (RX 123 at 840- 841, 847, 848)

529. In fact, Harvey testified that the inventors tried to cover any device capable of serving as a digital detector. (RX 123 at 846-847, 849, 850, 851).

Q Dr. Williams, I put figure 2A up again from the '490 patent. Isn't it also true that there's nowhere in either the '490 or the '277 patent where a digital detector is expressly defined as having a tuner, a demodulator and a comparator?

A I don't think I saw that anywhere in either of the patents. Specifically, I don't.

(Williams, Tr at 554).

530. According to Harvey, there are many different forms of digital detectors, including processors, certain receiver equipment, and comparators. (RX 123 at 396).

531. Mr. Harvey testified that the boxes labeled digital detectors 34, 37 and 38 may be but are not necessarily alike. (Harvey Dep. 395-396).

M. Enablement

532. Respondents' expert Schreiber, with respect to a worker of ordinary skill in the art testified (Tr 1572 to 1576):

.... Professor Schreiber, do you have an opinion as to whether workers of ordinary skill in the art could have constructed a device covered by claim 6 in 1981?

A Well, my answer would be the same for all three claims, so it doesn't really make any difference which one is up there. This one is 44, but I

must be very careful when I say I don't want to be misunderstood: The technology involved in implementing a pay television system is not very complicated. Of course, the best technology to use changes from time to time according to the development and availability and pricing components.

But given the specification of the characteristics of a particular pay television system, such as the one embodied in these two patents, a person of ordinary skill in the art would have very little difficulty in building a system that had those operational characteristics.

However, in performing that implementation, the person of ordinary skill in the art, in my opinion, would get no help from these patents and in some cases would be seriously misled.

Q And in what respects would they be misled?

A Well, I gave one example this morning of the section talking about digital video, and I believe I gave the reference to that section, but they would also be misled, I believe, how to manage the ordinary circuitry of some of the digital logic.

Now, I prepared a diagram at my own initiative to illustrate one of these problems.

Q I think Professor Schreiber is talking about RX 337.

A I am. I must apologize a little bit for this diagram because the middle part of it is so small, that I'm sure his Honor cannot see it from where he's sitting.

Q Let me see if I can put it on the video system.

A What I've done here is define three diagrams from the '277 patent in accordance with the instructions in the patent as to what goes on in which one.

Q And which diagrams are those?

A The innermost diagram is from figure 3A, and the next one is from figure 2A, and the outer one I've seen I've neglected to indicate, but I think I can easily find it. It's figure 2. The outer one is figure 2.

Now, I believe I faithfully followed the instructions in the patent as to which diagram goes inside of which.

Q Where did you find those instructions in the patent?

A Well, some of it was from the drawings themselves where they indicated where various wires went and some was from the description of these diagrams.

Now, this whole circuit over here is more or less the functional equivalent of the IRD, except I haven't yet found where the signal comes out, but I'm sure it must come out there somewhere. I just haven't located it. There are various wires coming out in different places, and perhaps it's there. But the circuitry in this diagram is, as I say, at the most, the functional equivalent of the IRD. But it's about 10 times more complicated, needlessly slow, needlessly so in my opinion. I counted the number of microprocessors in there at one point, and it's quite large.

Now, it is possible to build -- to design and build very efficient circuitry using more than one microprocessor. But to do that, one must have very well-defined interfaces amongst the various units, and they may have microprocessors inside them. For example, in contracting out -- when Hughes contracted out the design and construction of the various parts of the system, they had to do that, not just the IRD, but the control -- all the equipment in the uplink and so forth and the production end of the system.

And I read some of the documents, and I admired them very much. I thought they did an excellent job of running this project in the sense that they had very well-defined interfaces, and when all the contractors finished, they worked and put this stuff together, and it worked. Now, in a case like this where you don't have well-defined interfaces because you have wiring going all over the place, you have a lot of microprocessors with no instructions whatsoever about how to program them to work together, not even a single flow diagram.

A person of ordinary skill in the art who set out to implement this system using the techniques involved in the patent, in my engineering judgment, would be making a serious error. He would be much better off to take the specifications and start from scratch.

He further testified (Tr 1617 to 1628):

Q Dr. Schreiber, I think you anticipated the next question I wanted to get into. You testified during your direct examination that one of ordinary skill in the art in 1981 could build the system contemplated by all three of the claims that are before this tribunal today.

A Well, I was fairly specific about what I meant by the system. I meant by a system that had the same functional characteristics. I wasn't talking about the structure of the system at all.

Q But just addressing your attention, sir, as a practitioner in this field for a good many years, to figure 2 behind you, there is shown there those two boxes and circles, and I think you said those are called mixers.

A Right.

Q That's circuitry that anybody in the radio or television field since 1945 would understand; is that not right?

A I don't think I've objected to the description of mixers.

Q And there's a block there that's called radio signal decoder and that's block 40, and that's shown in the patent as figure 2B. Let's just get 2B on the screen. 2B tells us if we want to extract a digital signal from a radio carrier, we start off with some receiver circuitry in box 41, and we have to extract the digital signal out of the radio carrier, and we do that in box 42, and we put it into a digital detector --

A Excuse me. You extract the digital information in the radio decoder?

Q Yes.

A What's the form of the digital information that -- I'm sorry, I have to ask questions, but I'm trying to clarify your question so I can give an accurate answer. What is the form of the signal that goes from the decoder to the detector?

Q Let me ask you a -- let me withdraw the question I asked you and start over again.

JUDGE LUCKERN: Thank you, Mr. Taylor.

BY MR. TAYLOR:

Q For an individual setting out to design the system that is shown in figure 2 that's now on the screen behind you, and given the block diagram that's suggested by figure 2B as to the circuitry that one might find in this radio signal decoder in figure 2, for a person setting out to define a system, like the DSS system, they would define, would they not, the frequencies, the formats of modulation, the digital formats for determining what had to be extracted at the receive end, that would all be part of the way the system was defined?

A The system would be -- if Hughes were doing it, judging by their performance in the current project, if Hughes were doing it, they would define the unit, whatever it was, radio decoder or anything, they would define it in such a way that there was no question whatsoever about what was desired to be built.

Q I will accept that answer, but isn't it also a fact, sir, that if you handed one of your graduate students the drawing behind you and said I want you to design a system that transmits a coded signal, both in a television spectrum and in an associated FM signal that goes along with the television signal, that's a relatively trivial design project?

A Well, I would prefer to start off with this figure over here, with figure 2, and there's a box that says "radio signal decoder," and I tell my students what I want you to do is design some scheme where we can put some digital information into the radio signal in addition to what's normally in the radio signal, and we should be able to detect it with some processing at the receiver. And if I gave it to a class of 40 students, almost all of them would come up with a workable solution.

Q Going back now to the question of what constitutes -- let's put the -- let me withdraw the question and comment on a couple of details of this.

There is shown some inputs to the buffer/comparator coming in from the top. Do you see those?

A That's right.

Q And do you know what those are intended to be?

A I believe those are supposed to contain information that's to be compared by the buffer/comparator with the digital data that is extracted from the signal.

Q Take a look, if you would, sir, at figure 2D, which I'm going to put on the screen.

JUDGE LUCKERN: And that's of the '277 patent.

MR. TAYLOR: 2D of the '277 patent is now on the screen before the witness.

BY MR. TAYLOR:

Q Have you taken a look --

A Let the record show that I'm looking at the patent itself rather than the patent on the screen.

Q All right, sir. Have you paid attention to 2D in the past?

A Yes, I looked at 2D.

Q 2D shows, does it not, selected frequency going into a decoder box 29, selected frequency going into decoder box 28, selected frequency going into decoder box 27, each of which is putting out a digital signal that is being compared with something in the buffer/comparator?

A I see that.

Q And isn't it accurate to say that what 2D suggests to us is that you could put these control signals on a variety of different frequencies as their location, separate and apart, of course, from the normal transmission location defined in the preferred embodiment?

A Well, in my previous answer to your question, I said I thought those inputs, those other inputs were -- they might carry some data against which the output of units 30 and 40 were to be compared. But in this configuration, figure 2D, that's clearly not the case because it appears that the outputs from the three additional decoders on the top are much like the outputs from decoders 30 and 40. So presumably one or more of them is going to get compared to something else, rather than to each other, and conceivably, it's the input from the PRAM controller. I don't really know.

Q Is it accurate to say, Dr. Schreiber, that the parts of figure 2D that have to do with control signals coming in on different frequencies and being used for different control purposes is really more the domain of digital computing than it is television?

A I don't think there's much about digital computing in here. It's clear that many of the circuits are said to be digital circuits, although I think in the case of -- in the case of the digital detector in figure 2A, the patent says that the output is digital, but it doesn't say that the circuit itself is digitally implemented.

As I've said a number of times, the subject at issue here is television system design. Now, of course, to design a complicated television system, you have to do a lot of signal processing. Some of that signal processing may be analog, and some of that signal processing may be digital, but it's still television system design. Maybe I misunderstood your question.

* * *

Q What figure 2D tells us, Dr. Schreiber, is that each one of those decoder boxes for a separate frequency can be any of three suggested formats for digital detection. It can be in the format of figure 2A, figure 2B, or figure 2C. Would you agree with that?

A That's right.

Q And we've looked at figure 2A extensively. I showed you figure 2B a moment ago. Let me put figure 2C on the board.

* * *

Q Figure 2C is described in the text of the patent as being just a potential circuit for extracting the digital control signal from some other kind of receiver, not a radio and not a television; isn't that right?

A Figure 2C doesn't tell me, like figure 2B, tells me nothing about what the circuit is supposed to look like.

Q Irrespective of what it tells you about what the circuit is supposed to look at, I am correct, am I not, that the patent tells us that one trying to achieve the objectives of the patent can use figure 2C and can extract control signals from transmissions, other than television or radio?

A Well, it's an idea thrown out. I mean, it's not at all an instruction that a person of ordinary skill in the art could use to do anything.

* * *

JUDGE LUCKERN: Go ahead, Mr. Taylor.

BY MR. TAYLOR:

Q The patent does suggest, does it not, Dr. Schreiber, that one trying to implement its designs can put the control signal in, for example, a microwave transmission?

A But that was done years ago.

Q Do I need to go get the patent out or do you want to help shortcut this by acknowledging that it does, in fact, suggest that?

A It suggests that you can put the signal in a lot of places, broadly defined, yes, it does.

Q And one of those is microwave transmission?

A I don't recall, but I'll take your word for it.

Q And figure 2C of the '277 patent is intended to depict the detection circuitry for one of those other transmissions other than video or audio; right?

A I think that's correct. Wait a minute. Let me see. Yeah, I think that's correct.

Q Is it fair to say, Dr. Schreiber, that the authors of the patent essentially assume that the person who is trying to implement the digital control techniques that they've tried to describe here already knows how to design a television system?

* * *

Mr. Taylor, in response to your question, I have no idea what the authors of this patent believed about that.

BY MR. TAYLOR:

Q It is pretty clear, isn't it, Dr. Schreiber -- let me ask it a different way.

When I took your deposition, you told me and you thought -- and indeed, you testified here today that someone of ordinary skill in the art in 1981 could have designed the system that the patent was trying to describe in the claims?

A Design a system as described in functional terms, not in terms of implementation.

Q Right.

A Even this implementation that you have in this picture.

Q Could have been designed by someone of ordinary skill in 1981.

A To perform in the way is described in the patent, right.

Q And is it also accurate to say that the patent really makes no effort to teach an improvement to the way of demodulating or transmitting or handling television transmissions?

A I didn't find any traces of that in the patent.

Q And is it fair to assume from the fact that you didn't find any traces of it in the patent, that the patent really assumes that the person who is going to sit down and try to implement the invention already knows how to design a television system?

A Well, I don't think I can go along with that because again, you're asking me to figure out what the inventors assumed and there are so many different architects of this patent that trouble me, that I just have no idea what the inventors assumed.

533. Respondents' expert Schreiber, as to the term "digital detector," testified

(1415 to 1418):

Q Prior to February did the term "digital detector" have any particular meaning to you?

A It certainly doesn't describe any specific circuit, for example. Now, I am in the business of communicating digital signals. It has come up in the case of high definition television, which is a digital system, and the manner in which the digital information is modulated on to the carrier and the manner in which it is demodulated at the receiver to get back to the digital data stream that goes in the encoder at the transmitter has been a subject of active investigation and R&D in the U.S. for the last -- in connection with the HDTV process since 1987. More than 10 years now. And we don't normally talk of digital detectors in this business. We talk of demodulators, the purpose of which is to extract the digital modulation, the digital information that was modulated on to the carrier. And these turn out to be very complicated. They depend very much on exactly what modulation method is used, of course. But they also depend on what transmission conditions under which you still expect to get adequate error performance in the system, how much noise, how much ghosts, et cetera, et cetera. So, although given a particular problem, a person skilled in the art of digital communications could certainly define something that performed the function of the device here called the digital detector, the patent doesn't tell you anything that would do that.

Q Back in 1981 in particular, do you have a view as to whether one of ordinary skill in this art could have constructed a digital detector for receiving television program transmission and detecting a predetermined signal in that transmission?

A Well, if I knew what modulation method had been used to embed the digital information, then I or any other person of ordinary skill in 1981 could have designed a suitable circuit. But we wouldn't have gotten any

guidance from the patent because there is no discussion in this of either the modulation method or the detection method.

- Q In 1981 did the phrase -- well, let me back up. If you or others of ordinary skill in 1981 constructed such a circuit for detecting digital information, would you all design the same circuit?
- A Probably not.
- Q Would there be many different circuits that could accomplish that function?
- A Yes.
- Q Would the term "digital detector" as it -- if it were used in 1981 -- have designated any particular one of those circuits?
- A No, it wouldn't.
- Q Would you have understood it -- and do you understand it today -- to embrace all types of circuits that can accomplish the functions stated in the rest of the element?
- A My understanding is that that is not within the patent law, what you just said. But the inventors here seem to be talking about --

JUDGE LUCKERN: I guess --

MR. TAYLOR: I will wait until the answer is finished, Your Honor.

JUDGE LUCKERN: All right. Go ahead, finish your answer.

THE WITNESS: The inventor seems to have in mind a circuit that would recover the embedded digital information without saying what kind of a circuit it would be or even what the modulation method was used.

As seen from the supra, if a designer knew what modulation method had been used to embed the digital information, then a person of ordinary skill in 1981 could have designed a suitable circuit, although that person would not have received any guidance from the '277 patent because there is no discussion in said patent of either the modulation method or the detection method.

534. Complainant's expert Williams testified as to how certain elements of the '277 specification are controlled (Tr 3057 to 3058):

Q Dr. Williams, in figure 2A, there are input control information lines which go into line receiver 33, digital detector 34 and digital detectors 37 and 38. Do you see those?

A Yes, I do.

Q Does the patent -- the '277 patent or the '490 patent, do they define how those particular elements, 34, 33, 37 and 38, are controlled?

A I don't recall precisely them saying that these are controlled -- precisely how they are controlled.

Q Control of these elements is an important feature with respect to understanding the alleged invention in this patent, isn't it?

A The person who designed this system who used this technique would have to know how to control these.

Q There's no information in these patents that tells us how to control these elements in order to detect signals in various locations or detect signals in various timing patterns. It's just not -- there's no information that tells a reader how to do that, is there?

A Certainly there's some examples of where the signals may be -- some examples of where to find the signal. But specifics of how to build this device or control this device, I don't think that's in there.

535. Respondents' expert Schreiber, as to the '277 patent, testified (Tr 1410 to 1415):

Q What interpretation did you give to the phrase appearing at lines 33 through 35 of claim six that reads "separately defined from standard analog video and audio television"?

A Well, this is another very troubling phrase and that makes the, it makes the interpretation very difficult. I did not read every word in the PMC and interrogatories, but I did go through the charts they prepared both for infringement and for support for the various claims in the two patents. I also searched the '277 patent for the expression separately defined and its only use is in the place where PMC referred to it for support for this claim. And in that case we are talking again about

figure 2A and about the third path. And it is clear from that, fairly clear from that, that separately defined in -- the discussion of claim 2A is talking about a separately defined signal path by means of which digital data could be recovered that is in neither the audio nor the video, okay? But that makes no sense when you apply it to this patent -- to this claim. Because using in this claim -- if you use the ordinary English definition of "separately defined," you can replace that with the word "different." Different from standard analog video and audio transmission. Then I have real trouble because if you look at this patent as a whole, what you find is it is about standard analog video. It is about imbedding digital data in standard analog video and extracting that digital data at the receiver to do certain things with it. That is the core idea in the whole patent. Yet, the plain words of the claim say that this claim applies to a system other than standard analog video. Now, I searched the patent to find out do they discuss other kinds of analog video, other kinds of video besides analog video. For example I searched the words "digital video" and there's a first use and last use of digital video. It is about ten columns. And the words are English, but the meaning is gibberish. In fact, this section is so confused that I had both of my colleagues, Bove and Bender at MIT, who are also working on this case, to read this section and tell me what they thought it meant. It means nothing. No one, no engineer who had any knowledge at all of the design of systems, television systems, would possibly use this method. These ten columns are devoted to a basic element in the system, the means by which a viewer who has paid for a program gets to see it, in this case Wall Street Week at 8:30. I paid the money, now I want to watch the program. And the process that is gone through by the system where the studio alternates between transmitting analog and video and so many other things happen, and at one point if they discover that tampering has taken place they permanently disable the receiver. I mean all sorts of things are thrown in there that make no sense whatsoever. Anyway.

* * *

THE WITNESS: The section I was referring to starts in column 162 and, I believe, toward the top.

JUDGE LUCKERN: That would be line.

THE WITNESS: Maybe line nine. And it continues, I believe, through column 172, line 55.

* * *

THE WITNESS: I was finished with my discussion of that particular

material, but now I was going on to another point.

JUDGE LUCKERN: All right. Why don't you continue on with this next point.

THE WITNESS: What I was going to say, to put it mildly, this discussion of digital video is not enabling. It is, as far as I know, it's the only discussion in the patent that really talks about other than standard analog video. And it does it in the manner that I have just described. Therefore, my conclusion is this patent is about analog video. And therefore I don't understand why this claim says that it applies to systems that are separately defined from standard analog video. I am afraid to give an opinion about the law here because I don't want to provoke any objections.

* * *

BY MR. TOUTON:

Q Given that lack of understanding about what is meant by that phrase, what working definition did you use in your work of analyzing whether this covered the DSS system?

A Well, the word separately defined might have gotten there by accident or by inattention. On the other hand, we don't have any evidence that the inventors or the people that wrote the patent were inattentive to what they were doing. And maybe it was put in there on purpose. The purpose in this case, however, if you accept what I said before about digital television that the patent is really about analog television, these words, instead of being a limitation, appear to be an attempt to extend the coverage of the patent to systems of a type that are not described in the patent.

Q So what definition did you assume for this phrase, if any?

A I'm sorry, what definition?

Q In applying this claim to the DSS system, what did you make of this phrase?

A Well, the question is, is the DSS separately defined from analog video? Of course it is. It is a digital video system. I mean you don't have to go deeply in the characteristics of the system to see that it is a digital, therefore, it is not an analog system.

536. Respondents' expert Schreiber testified as to what the input to digital detector

46 in the '277 patent would be (Tr 1793, 1794):

Q Below figure 2B is Figure 2C. I guess can you provide any information about what the input to digital detector 46 would be?

A This is even less definite than Figure 2B because, you know, Figure 2B has a block that says "Radio Receiver Circuitry." Now, I know what radio receiver circuitry looks like. When I was a kid I built some, so I know what is inside of a typical radio receiver. But here is "Other Receiver Circuitry" and there is no guidance whatsoever given as to what this other receiver circuitry does. And therefore, of course, there's no guidance as to how the digital detector performs its function.

And there is a controller in both of these, and, you know, I have no objection to a controller. Nowadays if you build any complicated apparatus you have a controller to make it work right.

537. Respondents' expert Crowther, who was asked to provide expert testimony describing prior teletext systems and to provide testimony about certain issues relating to claims 6 and 7 of the '277 patent (RX 142 at 1), testified as to the digital limitations of claims 6 and 7 (RX 142 at 26 to 28):

47. Which limitations of claims 6 and 7 are unclear and indefinite?

A. In both claims 6 and 7, it is my opinion that the preamble and the digital detector limitations are unclear.

48. Could you elaborate on why you think these limitations are unclear?

A. Yes. Looking first to the preamble of each of these claims, you can see that they require that a television program transmission be "separately defined from standard analog video and audio television." To the best of my knowledge, the specifications of the '277 and '490 patents do not define what is meant by the phrase "standard analog video and audio television." Thus, indicating that the television program transmission is "separately defined" from "standard analog video an audio television" provides very little information concerning the composition of the television program transmission. Even if the phrase "standard analog video and audio television." Thus, indicating that the television program transmission is "separately defined" from "standard analog video an audio television" provides very little information concerning the composition of the television program transmission. Even if the phrase "standard analog video and audio

television" had a clear meaning, the meaning of the entire phrase would still be highly uncertain in that it appears to define a transmission by what it is not, rather than by what it is.

The use of the term "separately defined" in the specifications of the '277 and '490 patents makes the meaning of claims 6 and 7 even more unclear. In column 21, line 62-66, the '277 specification describes the "separately defined" transmission in discussing Path C. of FIG. 2A. While there is no description of the transmission, it appears that the "separately defined" transmission is merely part of a television transmission. In lines 26-61 of column 21, the '277 patent talks about path a to detect "signal information" embedded in one or more of the lines normally used to define the television picture and path B to detect signal information embedded in the audio. Path C is apparently for detecting signal information embedded anywhere else in this same television signal.

In view of this, it is my opinion that the use of the term "separately defined" in the specification is inconsistent with its use in claims 6 and 7. There is no description of an entire television transmission being "separately defined" in the specification. It appears to me that this claim was drafted to try and cover any television transmission that was not basic analog video and audio, but the description in the specification only meaningfully describes an analog television transmission with digital information embedded in the signal.

49. Why do you find the digital detector limitations of claims 6 and 7 vague and indefinite?
- A. Because the term "digital detector" does not describe any particular circuitry or structure to me. I worked in the television industry my entire adult life and I have never met a digital detector. In claims 6 and 7, the digital detector is a functional term that appears to me to refer to any means for detecting digital information. Even the description of the function is vague in my view since the word "detect" can be given a number of different meanings. A smoke detector detects fire but does nothing about it. the smoke detector merely notes the presence of the smoke. This is one sense of the word "detect." another sense of the word "detect" involves noting the presence of the object to be detected and pulling it out for further observation. In the case of embedded digital information (which at this stage would be in an analog form), circuitry that detected digital information under this definition of the word "detect" would extract embedded digital information under this definition of the word "detect" would extract embedded digital information and convert it to a series of noughts and ones. In a third sense, the detection could involve demultiplexing of

digital information in which packets of digital information are received and only certain packets are selected. While circuits could have been built to accomplish these different detection functions, it is not at all clear which of these circuits is referred to by the term "digital detector."

In the '277 patent, the digital detectors are merely shown as boxes. The boxes labeled 34 and 37 in Fig. 2A appear to be devices that locate digital information, which is in analog form, in an otherwise analog signal and convert that information to logical ones and noughts. The digital detector 38 in Fig. 2A is more mysterious because the '277 patent does not describe how information is embedded in this alternate path. I find the specification of the '277 patent to be of no help in determining what is meant by the term "digital detector."

538. Respondents' expert Crowther testified that determining how "to implement the supposed inventions of claims 6 and 7 is left entirely to the reader of the patents." (RX 142 at 28).

539. Respondents' expert Crowther testified as to the teaching of the '277 patent (RX 142 at 29 to 32):

- A. With respect to claim 6, PMC cites to only a few sections of the specification.

In the Summary of the Invention, PMC cites a paragraph describing the general functionality of the alleged invention. It is in column 4 and reads as follows:

"The present invention provides a method for obscuring the meaning of the signals to prevent unauthorized use of the signals and of their associated programming. The meanings may be obscured through encryption so that apparatus described below are necessary to decrypt them. In addition, the pattern of the composition, timing, and location of the signals may vary in such ways that only receiving apparatus that are preinformed regarding the patterns that obtain at any given time will be able to process the signals correctly. Both the arrangement of the signal units in signal words and the locations, timings, and lengths of signal words in individual transmissions or groups of transmissions may vary in fashions that can only be interpreted accurately by apparatus that are preprogrammed with the keys to such variations."

Although this summary statement provides some basis for the language used in claim 6, it does not provide an enabling disclosure as to how one skilled in the art would: (1) vary a predetermined signal's location or timing pattern, (2) detect a predetermined signal based on either its varying location or timing pattern, and (3) program a controller with the varying locations or varying timing pattern of a predetermined signal, and thereby cause the detector to detect the predetermined signal based on either a specific location or time, as required by claim 6.

The remaining specification sections cited by PMC provide even less detail about how to make the invention of claim 6 than the description in the summary of the invention. There is no detailed description of the invention of claim 6, rather only vague and general statements of capabilities are made. In my opinion, these brief passages would not enable a person of ordinary skill to make the invention of claim 6.

In particular, column 6, line 66 through column 7, line 4 of the '725 patent states: "Path C inputs the separately defined transmission to a digital detector, 38. Detectors, 34, 37, and 38, line receiver, 33, and high pass filter, 36, all operate in predetermined fashions which may be changed by external controller, 20 (referring to FIG. 1), to be described below."

This cited section provides absolutely no details concerning how one of ordinary skill in the art would change the operation of any digital detector or what changes would be made, nor does it describe how a controller could be programmed to cause the change in the operation of the digital detector. The other sections cited by PMC read as follows:

Column 8, line 55 to column 9, line 7 of the '725 patent reads: "To facilitate the operation of the device, the controller, 20, can receive information from all operating elements of the apparatus. Control signals can be passed to the apparatus by means of the programming transmissions input at switch, 1, and mixer, 2. An example of such a control signal is an instruction for the apparatus to contact a remote telephone unit. The processor unit, 12, has the capacity to identify instruction signals for controller, 20, and pass them to controller, 20, over control information lines. buffer/comparator, 14, has the capacity to pass received time signals to the controller, 20, in a predetermined fashion set by and changeable by controller, 20. buffer/comparator, 8, and monitor or processor, 12, each have the capacity to inform controller, 20, when signals that they are instructed to look for in predetermined fashions, set by and changeable by controller, 20, fail to appear. Oscillator, 6, the controller, 20, and the buffer/comparator, 8, can interact in such

a fashion that buffer, 8, can identify the channel that any given signal is received on and mark the signal for subsequent identification of the channel."

Column 14, lines 48 to 63 reads: "The signal or signals necessary for the decryption of the channel that box, 114, passes to decryptor/interruptor, 115, in this case, is not located in the channel transmission. They may be preprogrammed into the signal processor (for example, in programmable random access memory controller, 20, in FIG. 1) or they may be transmitted in a channel other than the channel being transferred from box, 114. If signal processor, 112, has been preprogrammed with the signal or signals or if it has been informed of the predetermined fashion for identifying and processing the the [sic] needed signal or signals in the incoming transmission from facility, 113, for example, where to look for the signals and when and how, signal processor, 112, can transfer the signal to decryptor/interruptor, 115."

Column 17, lines 30 to 35 read: "FIG. 5 has not included control information connections between the signal processor, 130, and the remote decoders which would permit signal decoder, 1'30, to alter the methods of operation of said remote decoders. Such control information connections are included in signal processing apparatus and methods."

The passages I just read provide absolutely no detail informing one of ordinary skill in the art how to change the operation of any digital detector, nor does it describe how a controller could be programmed to cause the change in the operation of the digital detector.

In my opinion, if I were going to make the invention of claim 6, I would first have to speculate as to what the claim was describing, then I would have to draft a proper specification, then invent circuitry or at least experiment with standard computer techniques to develop a working system. The teaching of the patent would provide no guidance to me in this endeavor.

540. Complainant's expert Davis testified (Tr at 3178 to 3180):

JUDGE LUCKERN: Let me ask you this question, Doctor. Would the digital detectors 38, 34 and 37 in this figure 2A of the '490 patent that is before you, would they each require different internal circuitry because each of the detectors 38, 34 and 37 have a different input, or putting it another way, are detectors 38, 34 and 37 three different

embodiments of a digital detector?

THE WITNESS: The "embodiment" term is getting a little more legal than I'm comfortable with.

JUDGE LUCKERN: Forget that last and let me stick to my first question. Would the digital detectors 38, 34 and 37 each require different internal circuitry because each of the digital detectors 38, 34 and 37 have a different input?

THE WITNESS: The circuitry would be similar but not identical. More along the lines of the components. Dr. Williams yesterday afternoon was giving some general component and structure to the detector, but they would each have to be tailored to the particular input characteristics that they were expected to respond to. In path C you might be extracting the information off of a separate subcarrier within the composite video signal, whereas in path A, the line receiver has gone through and it's already extracting information off of a video display line. Whereas down in the bottom path B, you're dealing with some audio information.

So they would perform the same function and would have similar components, but they would all have to be tailored to the particular input characteristics that they are going to be dealing with.

* * *

Q Just so we're clear, Dr. Davis, in 1981 -- and you were one of ordinary skill in '81 -- if you looked at this and you knew that we're doing path A, would you have any problem designing a digital detector to deal with path A?

A No, sir.

Q What about path B, the audio, would you have any problem designing, from your knowledge, what you knew at the time, designing a digital detector that would work in box 37, which is path B?

A No, I don't think I would.

JUDGE LUCKERN: For the record, Mr. Ruyak is looking at figure 2A of the '490 patent. Please proceed, Mr. Ruyak.

Thus according to Davis, the digital detectors 38, 34 and 37 in figure 2A of the '490 patent

would require different internal circuitry because each of those detectors have a different input and thus each would have to be tailored to the particular input characteristics to which they are expected to respond.

541. Schreiber testified (Tr 1427 to 1430):

- Q Professor Schreiber, what interpretation did you give to the digital detector for receiving at least some information of said transmission and detecting said specific signal at a specific location or time in claim seven?
- A Well, this is very similar to claim six except now they are talking about receiving some of the embedded information rather than implicitly all of the embedded information. And the specific signal is now not varying but it is at a specific location or time.
- Q And were persons of ordinary skill in the art in 1981, in your opinion, capable without extensive experimentation of building such a digital detector?
- A Well, I would give the same answer as I gave to the same question in claim six, that knowing the modulation method, which is not specified, then a person of ordinary skill could construct a demodulator that would recover the digital information under the varied conditions I had talked about. But he wouldn't get any guidance in doing that from the patent.
- Q Would the term "digital detector" have conveyed any meaning with respect to the particular structure that ought to be used for that circuit?
- A No, it would not.
- Q The next element begins with the phrase "a storage device." What did you understand that to mean?
- A Well, the words "storage device" are normally pretty plain. It is an electronic system for storing, like the disk on a PC or the random access memory on a computer.
- Q And that device is stated to be operatively connected to the digital detector and for receiving detected digital information that sends specific signals and assembling at least some of said digital information into either information or instruction message units. What did you understand by the term "assembling" as used in claim seven in the

context of the overall patent.

A I would like to interject that the word "information" troubles me a little bit, too, because I don't know what the difference between the information of said transmission and the transmission itself may be. But as far as "assembling" is concerned, that is an ordinary English word and it means put together. For example, we assemble a crossword puzzle from the pieces and that is what I take it to mean here.

Q What did you understand by the phrase "either information or instruction message units"?

A The recovery of digital information could, using the terms in the patent, could be utilized to operate something that is an instruction message unit, or simply provide information like today's temperature or something like that.

Q And did you have any understanding about the "message unit" part of that phrase?

A Well, the overall impression you get is that information is transmitted in words and words are put together into units. However, there is an expression -- oh, yes, I found it, Your Honor. It is column 10, line 29 --line 31. And I would like to read it to you. "There's a distinction between words and unit signal words may contain parts of signal units, whole signal units or groups of partial or whole signal units or combinations." Now, what this seems to mean is that assembly is sometimes dissection because the words may be bigger than the units. What this particular sentence adds to this specification besides confusion I don't really know, but it calls into question exactly what is meant by assembly.

542. Complainant's Williams testified (Tr 2996 to 3005, 3060 to 3061).

Q What would be the nature of a signal that would require path C in figure 2A as it's envisioned by the patent?

A It might be useful if I can draw a sketch.

Q Why don't you draw a sketch.

* * *

THE WITNESS: Let me draw up here, first of all, a box I'll label digital detector, and just for clarity, I'll put 38 on it because I'm talking about this digital detector right here.

JUDGE LUCKERN: Thank you. I appreciate that.

MR. TAYLOR: "Here" as in path C.

THE WITNESS: In path C, that's correct. If I take a look at the input and the output to this, I have a pretty good idea, for this particular embodiment, this example embodiment what the input is going to look like. If I put in -- if I draw here a spectrum, I have my baseband video, and I'm going to draw, roughly, part of the spectrum, and I'll call that video. I'm then going to have any audio, which is on a carrier, and these are going to all of these places, here, here, here.

JUDGE LUCKERN: When you say "these," these --

THE WITNESS: It goes on path C, path A and path B. This spectrum is going to all of those places.

* * *

THE WITNESS: Also, the inventors tell us, in addition to being able to put the signal here and this audio spectrum --

JUDGE LUCKERN: And here, you said block 35; correct?

THE WITNESS: Well, basically, there is the possibility of putting the signals in the audio spectrum, which would be through that path that goes through box 35.

JUDGE LUCKERN: Which path is that?

THE WITNESS: Path B.

JUDGE LUCKERN: All right.

THE WITNESS: They also talk about the possibility of putting the information, the vertical blanking interval which we find, through path A. In addition, they say it may be somewhere else. Now, one possibility where somewhere else may be is, for example, on another carrier. That would be another possibility. If that's the case, then all of this information would be presented to path A, path B and path C.

I've drawn a spectrum over here, but I'm going to change modes a little bit. On the output here -- I'll just write the word, a bit stream of some sort, and that's what I'm trying to get out of here, a bit stream.

BY MR. TAYLOR:

Q "Out of here" being?

A Out of digital detector 38. Let me draw a line here. I'm going to take a look at what functions I need inside of here, inside digital detector 38, what things digital detector 38 needs to do. It needs to select -- let me call it select embedded carrier. I'll say embedded.

Q Just so the record is clear, "carrier" in that reference --

A What I'm trying to do here with this block is to select -- it's not just the carrier. It's the carrier and the information that's on it, but I have to have a box --

JUDGE LUCKERN: Why don't you give that a 1 or whatever, some label.

THE WITNESS: Let me put an A on that circle.

* * *

Q And what's the structure? Let's take this in small bites. What's the structure you need in order to select this embedded carrier?

A I need a tuner, a selector of some sort to do that.

Q And what kinds of circuits will perform that function?

A Well, certainly, I could use a mixer followed by a fixed filter. I could use -- if I know precisely where this is going to be, I could perhaps use a fixed filter.

Q "This" being?

A This being this portion of the spectrum, the portion of the spectrum at interest. If I knew it was going to be in a number of fixed places, I could use different filters and choose among the filters. It wouldn't be as good a design, but, in fact, I could have a tunable filter that would choose a particular -- I mean, there are a lot of different ways I could tune to this carrier out of this group.

Q What next do you have to do inside box 38 after you tune to the carrier that you've designated as A?

A Let me draw a little line around here. I'm going to draw another

spectrum right above this. What I've done in this box is to keep A and get rid of the rest. Now, I might have moved A also. That doesn't matter. But the important thing --

Q Explain to the Judge what you mean when you say "I might have moved A"?

A Well, if my -- if the approach that I used to get this particular portion of the spectrum out of the overall spectrum was to use a mixer followed by a fixed filter, then what I would have done with the mixer, I would have moved this entire spectrum with respect to the filter so it would line up with the filter, as we talked about before, so that the only thing that would get through would be this part of the spectrum, possibly relocated to a different frequency band. But still, the information, that information would get through and I'd be eliminating the other information.

Q Hold on one second, Dr. Williams. When you said "as we talked about before," let me get a copy of one of our previous exhibits so we can show that to the Judge. I'm going to hand to the witness what was previously admitted into evidence as CPX 75 and just ask him briefly to refresh your Honor as to what its significance is.

A This is an example of how I might select a particular portion of the spectrum out of a broader spectrum. And what I had here was a whole group of channels which is lots and lots of spectra up here. What we do by mixing is to move this in frequency space so this block A, for example, gets moved to a lower frequency down here. Block B also gets moved, but that doesn't really matter too much to us because what we've done is take block A and line that up with the pass band of the filter. This particular filter is a pass band filter; it rejects everything outside of this region and passes everything inside this region.

By lining this block of frequencies up with that pass band, those frequencies get through. It's important to notice, though, in addition to getting through, they have been moved in my frequency space to a different band of frequencies. It doesn't matter because my information still resides on them.

Q Just so the record here is completely clear, Dr. Williams, tell us the structure shown on figure 1 that actually accomplishes this tuning function by which the whole spectrum is moved so that a portion of the spectrum lines up exactly with the band pass filter.

A In that example, where we're looking at the carriers, that spectra is

coming in, and the local oscillator is presenting a particular frequency to the mixers. And by mixing the local oscillator with the incoming signal, one of the results we get out of this is this spectrum moved.

Q And what actually carries out the movement of the spectra?

A The mixer does that, and --

Q What do you actually change to cause the spectrum to move?

A The oscillator chooses how you move it. The mixer does the operation.

Q So going back to the internal structure of block 38 on figure 2A, continue with your description of the process by which that filter -- or that signal gets selected.

A After I've done that whole process and I've demodulated the signal, I still end up with this baseband video, and this audio, and something else which I've drawn here as being another point in the spectrum. I then have to go about selecting this, selecting this particular block and that's what this box here would do, and it could do it in exactly the same way. That would be one option.

Q Exactly the same as what?

A Exactly the same way we described here for selecting a particular channel out of many channels.

Q And your reference to here is figure 1?

A Figure 1 and the mixer is the local oscillator. That would be one way you could do it.

Q What else would you expect to find inside box 38?

A Well, I still have my information sitting on a carrier here. I have to demodulate that.

Q Refresh us on what carrier and information -- what those two words mean in this context.

A I'm drawing a box here I'm labeling demodulator. I have a bit stream or whatever. My information has been used to change some of the characteristics of a higher frequency carrier. This moves my information out from the baseband to some higher frequency, so it's

sitting up here around this carrier. The information is around this carrier. What I want is to get rid of the carrier and get back to this information, bit stream or whatever, and what I have here is the demodulator, this box here, following this thing that I used for selecting the embedded carrier.

Q Why don't you put a B on demodulator.

A Okay.

Q The witness has put a B on the demodulator on CPX 85. And the demodulator, in a sentence or two, what does it do?

A It's going to get rid of the carrier and get our information -- get the modulation back down to baseband.

Q What else would you expect to be in box 38?

A I'll come down here to another box I'll label C, and I'll call this, for want of something better, some sort of digital processing and I'll explain what that is.

Q In a sentence or two, tell us what digital processing refers to.

A Well, if this demodulator -- conceivably coming out of the demodulator, I could have something that has already been converted to ones and zeros. Ultimately it could still be an analog signal and need some further processing, shaping of pulses and that type of thing, to get it into a bit stream. I also might look for patterns in that bit stream, do error correction -- there are a lot of different things I could possibly do. But what's going to come out of here, then, is some sort of processed bit stream.

Q Just so the record is clear, the bottom portion of this box you've drawn has boxes A, B and C. Select embedded carrier is A; demodulator is B; and digital processor is C. Now, draw a box in red around that that would represent the portion that is box 38 on figure 2A?

A I was describing with this what needed to be in box 38, so all of those elements would be in box 38 in this particular example, embodiment.

* * *

Q You've set forth several components inside what Mr. McBride later identified as box 38. How did you know that's what ought to be inside the box?

A I was basing it on the information I had about the signal on path C in this particular example embodiment. I knew I had to have the video baseband. I knew that the audio had to be there on the carrier, and I also knew there had to be some other signal. That's what they talk about for path C.

They don't say what that other signal is, but there's going to be some other signal. I knew I had to have some mechanism for selecting that other signal from whatever else was there. I'd demodulate it, and I knew I'd have to do possibly some further processing to get the bit stream out.

Q So you didn't know what goes in the box because it's called a digital detector. You knew what went in the box because of the information in the patent that told you what you wanted to do?

A In this example, I knew what was on path C because of this example [emphasis added].

543. The '277 patent specification describes and claims tuners and demodulators as distinct from digital detectors. (CX 2, Fig. 2, 2A, claims 1, 2, 3, 8 of '277 patent).

544. [There is no finding 544]

N. Experts

545. Dr. Ron Williams was qualified as an expert, for complainant, in the field of electrical engineering with specific reference to computer and digital systems (Tr at 286).

Dr. Ron Williams is an Associate Professor of Electrical Engineering at the University of Virginia, Charlottesville, Virginia. (R. Williams, CX 5, at 1, Q4-5).

546. Dr. Ron Williams teaches primarily in the area of digital system design and computer design which include the study of logic elements, data paths, control units, and the interconnection of computers. (R. Williams, Tr at 271).

547. Dr. Ron Williams was awarded a Bachelor of Science degree in 1977 and a Master of Science degree in 1978 in Electrical Engineering from the University of Virginia, and a Doctor of Philosophy degree in Electrical Engineering from the Massachusetts Institute

of Technology in 1984. (R. Williams, CX 5, at 1, Q6).

548. Dr. Ron Williams has been on the faculty at the University of Virginia since January, 1985. In the year prior to that, Dr. Williams' worked as a member of the technical staff at MITRE corporation. (R. Williams, CX 5, at 2, Q7).

549. Dr. Ron Williams is a member of the Institute for Electrical and Electronics Engineers ("IEEE") and the IEEE Computer Society. (R. Williams, CX 5, at 2, Q8).

550. Dr. Ron Williams is a named inventor on the following four patents:

5,355,042 - Magnetic Bearings for pumps, compressors, and other rotating machinery.

5,347,190 - Magnetic Bearing Systems

5,262,692 - Variable Voltage Switched Current Control

4,608,700 - Serial Multi-Drop Data Link

(R. Williams, CX 5, at 2, Q10).

551. Dr. A.J. Nichols was qualified as an expert, for complainant, in the field of computer software, embedded microprocessors and computer technology (Tr at 589).

552. Dr. Nichols is President of Probitas Corporation, where he performs a wide range of computer engineering functions including the development of software, firmware, and hardware; consultation on systems architecture; and audits of technical management. (Nichols, CX 6, at 1-2, Q4-5, 7; Nichols, Tr at 586).

553. Dr. Nichols was awarded a Bachelor of Science degree in both Electrical Engineering and Business from the University of Colorado in 1960. He received a Master of Science and Doctor of Philosophy in Electrical Engineering from Stanford University in 1962 and 1965 respectively. (Nichols, CX 6, at 1, Q6; Nichols, Tr at 586).

554. Dr. Nichols has worked on a broad range of projects requiring the ability to develop and understand systems without prior knowledge of the specific application. Those projects include a supermarket checkout system, a modem, a process controller, local area networks, security systems, a GPS receiver and a number of device drivers. (Nichols, CX 6, at 2, Q7; Nichols, Tr at 586-87).

555. Dr. Nichols previous employment includes management and development at Millennium Systems, Intel, American Microsystems, and Novar Corporation. He has also performed research and software development at Lockheed. (Nichols, CX 6, at 2, Q7; Nichols, Tr at 587).

556. Dr. Nichols has taught a number of graduate-level courses at Stanford University in logic design, switching theory, and computer architecture. (Nichols, CX 6, at 2, Q7; Nichols, Tr at 586).

557. Dr. Nichols is a Senior Member of the Professional and Technical Consultants Association and Chair of its Ethics and Client Satisfaction Committee. He is also a member of the Institute of Electrical and Electronics Engineers and the Association for Computing Machinery. (Nichols, CX 6, at 2, Q8).

558. Dr. Nichols is a named inventor on the following three patents:

5,170,470 - Integrated Modem Which Employs a Host Processor as its
Controller

4,119,995 - Circuit for Display, Such as Video Game Display

3,678,462 - Memory for Storing Plurality of Variable Length Records

(Nichols, CX 6, at 2, Q9).

559. Dr. Nathaniel J. Davis IV was qualified as an expert, for complainant, in the

general area of electrical engineering, both in communication systems, and in particular, computer systems in relation to data communication and signal processing (Tr at 3105-06).

560. Dr. Davis is an Associate Professor in the Bradley Department of Electrical and Computer Engineering at Virginia Polytechnic Institute and State University in Blacksburg, Virginia. The school is also known as Virginia Tech. (Davis, CX 9A, at 1, Q3-5).

561. CX 41 is a correct copy of Dr. Davis' curriculum vitae. (Davis, CX 9A, at 1, Q2).

562. Dr. Davis was awarded a Bachelor of Science degree in Electrical Engineering from Virginia Tech in 1976, a Master of Science degree in Electrical Engineering from Virginia Tech in 1977, and a Doctor of Philosophy degree in Electrical Engineering from Purdue University in 1985. In addition, Dr. Davis completed the U.S. Army Signal Officer Basic Course in 1977, the Advanced Signal Officer Course in 1981, and the Teleprocessing Operations Officer Course in 1981, while serving in the United States Army. (Davis, CX 9A, at 1-2, Q6).

563. Dr. Davis spent twelve years in active duty in the United States Signal Corps where he attained the rank of Major. His last four years of duty were spent as an Associate Professor at the United States Air Force Institute of Technology in Dayton, Ohio, where he taught a variety of courses in computer engineering. Dr. Davis is currently a Lieutenant Colonel in the United States Army Reserves and works as Research and Development Coordinator at the U.S. Army Night Vision and Electronic Sensors Laboratories at Fort Belvoir, Virginia. (Davis, CX 9A, at 2, Q7).

564. Dr. Davis left active Army duty in 1989 and joined the faculty at Virginia

Tech as an Associate Professor, where he teaches courses in computer and electrical engineering. (Davis, CX 9A, at 2, Q7).

565. Dr. Davis is a Senior Member of the IEEE, and a member of Sigma Xi, Tau Beta Pi, and Beta Kappa Nu. (Davis, CX 9A, at 2, Q8).

566. Dr. Davis was qualified, without objection, as an expert in the general area of electrical engineering, both in communication systems, and in particular, computer systems in relation to data communication and signal processing. (Davis, Tr at 3105-06).
even a person of ordinary skill in this field in 1981.

567. Graham S. Stuffs was qualified as an expert, for respondents, in connection with the analysis of the Venture Capital Proposal as it relates to claim 3 of the '277 patent (Tr at 1184).

568. Gerald O. Crowther was qualified as an expert, for respondents, in electrical engineering, including television receiving systems, teletext technology and microelectronics (Crowther Tr at 1220).

569. Mr. Crowther has experience involving television receiving systems, teletext technology and microelectronics as a result of his work at Mullard/Philips Central Application Laboratory where he played a role in the establishment of teletext and videotex in the United Kingdom, Europe, and the United States. (Crowther, RX 142 at 3, Q13; RX 143).

570. Mr. Crowther was responsible for the team that designed the integrated circuits for the United Kingdom teletext and the French (Antiope) teletext systems and played a major role in harmonizing teletext and viewdata specifications and standards. (Crowther, RX 142, at 4; RX 143).

571. Dr. William F. Scheiber was qualified as an expert for respondents, in the field of electrical engineering, including television design and engineering, and imaging signal processing (Tr at 13430)..

572. William F. Schreiber is a retired professor of electrical engineering at MIT and image processing has been the main area of his activities. (W. Schreiber, RX 169 at 1:18-21; 2:20-23, 5:5.6). He holds a B.S. and M.S. from Columbia in electrical engineering and a Ph.D. in applied physics from Harvard. (W. Schreiber, RX 169 at 4:13-16; RX 170).

573. Professor Schreiber has worked extensively in television, facsimile, computer-aided printing with extensive practical applications in all three areas, (W. Schreiber, RX-169 at 3:4-5) and has received 30 patents in these and related areas. (Id. at 8:22-25; RX 171).

574. From 1983 until 1990, when Professor Schreiber was director of the Advanced Television Research Program (ATRP), he worked in the area of high-definition television. MIT was part of the "Grand Alliance" that developed the digital television standard adopted by the FCC in December 1996. (W. Schreiber, RX 169 at 3:11-18).

575. Since retiring from MIT in 1990, Professor Schreiber has been (1) involved in the continuing activity in digital TV broadcasting at MIT, (2) directing PhD students in High Definition Television, (3) participating actively in the FCC Inquiry into digital broadcasting, (4) advising students informally, and (5) serving on thesis committees. He also has been consulting in the field of digital TV broadcasting and serving as an expert witness in the fields of television, facsimile and color reproduction. (W. Schreiber, RX 169 at 3:18-25, 4:3-11).

576. Professor Schreiber has received a number of awards, including the Journal

Award from SMPTE four times and from the IEEE Transactions on Communications once. He is a Fellow of IEEE and SMPTE, having received the David Sarnoff Gold Medal from the latter. Professor Schreiber has also received the SPIE (now Society for Imaging Technology) gold medal, and the Honors Award from the Technical Association for the Graphic Arts. In 1995, Professor Schreiber was elected to the National Academy of Engineering. (W. Schreiber, RX 169 at 9:16-27; RX 171). He has published one book and over seventy-five professional articles, focused on imaging and television topics. (W. Schreiber, RX 169 at 10:1-4; RX 170).

577. Bernard Marti was qualified as an expert, for respondents, in digital techniques applied to television from teletext to digital television including telematics (Marti Tr at 1910).

578. Mr. Marti received his Baccalauréate degree in sciences in 1960, an engineering degree from École Polytechnique in Paris (B. Marti, RX 172 at 2:16-19), and in 1968 a degree in Telecommunications. (B. Marti, RX 172 at 2:22-23).

579. After completing his university education, Mr. Marti joined the French Broadcasting Authority as a research engineer. (B. Marti, RX 172 at 2:26-27).

580. In 1970, Mr. Marti opened a new laboratory at the Broadcasting Authority which was devoted to the digitization and compression of video signals. In 1972, these activities were moved to a new center, the Centre Commun D'Études De Télédiffusion Et Télécommunications ("CCETT"), which Mr. Marti helped to create. (B. Marti, RX 172 at 2:27-3:4).

581. From 1972-1979, Mr. Marti was the department head of new techniques and new services at CCETT and eventually became Technical Director. In this role, Mr. Marti

participated in the creation of the ANTIOPE system and its application to broadcast teletext and interactive Videotex, as well as to other audiovisual techniques such as TV scrambling and program signalling. Mr. Marti holds several patents in these areas. (B. Marti, RX 172 at 3:4-8; 3:18-20).

582. Mr. Marti was Chairman of ISO-IEC/JTC1/SC2 (character sets and information coding) and helped to create JPEG and MPEG, which are standards for the digital coding of still and moving images, respectively. (B. Marti, RX 172 at 3:14-17).

583. In 1995, Mr. Marti was elected a Management Committee member to the Digital Audio Visual Council. He became a member of the Board of Directors in 1996. In 1997, Mr. Marti was nominated to his current position as the Director of Standards and Specifications for France Telecom. (B. Marti, RX 172 at 3:20-23).

584. Mr. Marti is an author of fifteen published works and presentations at conferences in the field of television, digital television and broadcasting. (RX 172; RX 173).

585. Dr. Walter Bender was qualified as an expert, for respondents, in the field of communication of interactive video, interactive computing systems, and computer graphics (Tr at 1947).

586. Mr. Neal Williams was qualified as an expert, for respondents, in Philips consumer-oriented circuit products including audio, video, and radio types of circuits in the United States during the period 1977 to 1982. (ALJ, Tr 2288-2289).

587. Mr. Williams was qualified as an expert in Philips consumer-oriented circuit products including audio, video, and radio types of circuits in the United States during the period 1977 to 1982. (ALJ, Tr 2288-2289).

588. Dr. Ciciora was qualified as an expert for respondents in the fields of

television and radio design and signal processing. (Ciciora, Tr at 2435).

589. Dr. Ciciora received BS and MS degrees in Electrical Engineering from Illinois Institute of Technology in 1964 and 1966, respectively. In 1969, he received a Ph.D. in Electrical Engineering from the same institution. (W. Ciciora, RX 207 at 2:9-12; RX 208).

590. Dr. Ciciora spent his entire career in television technology, strategy, and business planning and closely related fields, including consumer electronics, cable television, teletext, close captioning, data transmission in television signals, and electronic program guides. (W. Ciciora, RX 207 at 2:16-22).

591. Dr. Ciciora is an author of a number of papers on the technology and business aspects of cable television, teletext, interactive television and related technologies. (W. Ciciora, RX 207 at 2:22-25).

592. In 1979, Dr. Ciciora organized a special conference on teletext at the IEEE Chicago Spring Conference on Consumer Electronics and edited a Special Issue on Consumer Text Display Systems of the IEEE Transactions on Consumer Electronics. (W. Ciciora, RX 207 at 2:25-3:2; RX 163).

593. Dr. Ciciora holds nine patents, three of which relate to teletext systems and two others relate to cable television. (W. Ciciora, RX 207 at 3:2-5).

594. Dr. Ciciora was president of the IEEE Consumer Electronics Society for two years, chairman of Engineering Committee of the National Cable Television Association (NCTA) for four years, and chairman of the Technical Advisory Committee and on the Board of Directors of CableLabs, the cable industry's R&D consortium. Dr. Ciciora chaired the Joint Engineering Committee of the NCTA and the Consumer Electronics Group of the

Electronics Industries Association for eight years. He also chaired the Cable Consumer Compatibility Advisory Group of the Federal Communications Commission since 1992. (W. Ciciora, RX 207 at 3:15-17; 4:1-8). Dr. Ciciora was on the Board of Directors of the Society of Cable Television Engineers for six years. (W. Ciciora, RX 207 at 4:9-10).

O. Prior Art And Person Of Ordinary Skill

595. Teletext is a service that was developed by the British Broadcasting Corporation in the early 1970's. It is a method of using an otherwise unused portion of the television broadcast signal to transmit pages of alphanumeric and graphic information. (Williams RX 178 at 7).

596. With respect to the basic technical principles behind teletext:

A. The principle of Teletext was to utilize the vertical blanking interval, as shown in Exhibit RX 50. During this period no picture information is transmitted, but of course the line structure is maintained. Traditionally a number of test signals were inserted in this period. The technique of Teletext is to use this opportunity to insert coded data on the these blank TV lines at the point normally occupied by pictures in the rest of the raster. The data would not be seen, since in principle the screen is blanked during this period.

The basic format of the Teletext signal is shown in Exhibit RX 151. It consists of coded data and an address identifying the data. In fact all the teletext systems ever proposed can be defined by this general picture. It is the coding and address structure that is important to large scale integrated circuit (LSI) design and differs from system to system.

This was the inherent problem of the IBA and BBC proposals in that they had totally different structures in the one line period. The BREMA committee analyzed the basic requirements of a Teletext service and attempted to choose one optimal structure.

In the original schemes both the BBC and IBA had coded the alphabet based on the ASCII code and had protected it with a parity bit, see Exhibit RX 152. The bits of data were transmitted in the order b_1 - b_7 . As shown in Exhibit RX 152, the bits corresponding to the letter "A" are: 1000001. The letter "A" can

also be referred to by its column and row designation as: 4/1. The parity bit, b_p , was used for error determination purposes. The data rates, however, were different and it took two TV lines to send a complete row of 32 characters in the BBC case and four TV lines in the case of the IBA row. Both gave an unacceptably slow response to a moderately sized data base.

(Crowther RX 142 at 11, 12).

597. RPX 8 is an independent decoder and cable box (Williams Tr at 2356)

598. Williams testified (Tr at 2356 to 2358):

Q Can you demonstrate another feature of the teletext system which was incorporated in RPX 8?

A A standard feature of teletext, as described in the original teletext specification from the mid-1970s and incorporated in the Mullard teletext chip set, is the mix feature, which this over here allows us to mix or superimpose the teletext information, the page, along with the normal video broadcast.

So here I'm going to -- this is a little bit confusing because of the inset box that was part of the normal video, but I'll switch that back to being just the text.

Q Mr. Williams, the page we're looking at, page 200, is that part of the information that was contained in the broadcast that you taped, or was that information that you added to the broadcast?

A This was actually contained in the broadcast. The information here was -- of course, all the pages we're going to show were in the broadcast as they were related to the satellite and distributed around the country. These particular pages existed before we got there to add our own pages. These were pages that were being broadcast regularly by WTBS and outside of Atlanta, Georgia.

Q Mr. Williams, could you demonstrate the mix mode of the teletext?

A Right. I'll show that again here by pushing the mix button and I need to aim it over here. The teletext page is now superimposed or overlaid into the video, and you can see them both at the same time.

Now, if I switch back by pushing that button again, I have only the

index page. If I push 2 – sorry, I'm going to rotate. I'm going to go to 10, but I have to remember to aim it over here. I apologize. And I select page 210, which is the stock index. I've now instructed the teletext decoder to begin looking for page 210, and when it finds page 210, it will grab that page, write it into the page memory, and in conjunction with the teletext character generator, it will display that page on the screen. And these are stock indices.

599. With respect to the UK teletext system and the structure that was eventually chosen.

A. It was determined that teletext should be structured so that:

1. There was a simple, direct relationship between the data carried on a TV line and the final display.
2. If possible one row of data was carried on a TV line.
3. The minimum number of characters on a row was 40 to achieve an acceptable amount of data to be conveyed on a page.

To achieve these conditions, the amount of address data on a TV line had to be reduced. It was decided to organize the data base in terms of:

1. Pages - a full screen of data.
2. Magazines - 100 pages.

The address information had therefore to convey the magazine number, page number and row number of the data being sent at any given time. It was also felt that page should in addition have a time code for data which was not sent cyclically.

It was clearly not possible to incorporate all this data on to every TV line, especially when field tests already indicated that an unacceptable performance would be obtained if the address information was not highly protected. Errors during the address reception could give a mixture of data from two pages. The next major step forward proposed by industry was to decide that the page and time information should be sent only on the first row (R_0) of a page of transmission.

The only essential information which had to be sent on each row was the

row number. However at the time the BBC believed that a more parallel transmission would be more acceptable to the users.

Provision was therefore made so that, in a sequence of TV lines, data from several magazines could be transmitted. This necessitated the incorporation of the magazine number on each TV line of data. A receiver then had only to select those lines with the appropriate or selected magazine number after locating the requesting page address.

In addition, it was determined that the best way to ensure proper reception of an error-free page was to require that the memory be mapped according to row number and the location of data on the row. Furthermore, there was a one-to-one relationship with the location of data on the displayed row as shown in Exhibit RX 153.

If a piece of data contained an error then this data was not placed in the memory. So on first reception at a location, subject to errors, there would be some blank spaces. On the next reception it is likely that these locations with errors would be correctly received and the blanks would be filled on the second reception.

There will of course be errors on the second transmission but these would not disturb the data in memory. Obviously it was possible that errors would occur at the same location two times running, but this was rare and a third transmission was rarely necessary.

(Crowther RX 142 at 12-14).

600. The paper by Bernard Marti titled, "The Concept of a Universal 'Teletext' Decoder, Microprocessor Based," from the Symposium Record of the Eleventh International Television Symposium, Session VIIA, paper 3A (the Marti paper), was published more than one year before the earliest possible effective filing date of the '277 patent. (Marti Tr at 2094 to 2058; RX 222).

601. The Marti paper refers generally to a device for decoding and displaying teletext information on a standard television screen. The teletext decoder described in the Marti Paper consists of a "data acquisition unit," a "processing unit," and a "display unit." (RX 222 at 4). The data acquisition unit includes a "data demodulator" that receives a video

signal with inserted data, a "data demodulator," and a buffer. (RX 222 at pp. 4-5). The processing unit includes a microprocessor to receive codes from the buffer and interpret them, fill the "page store" interpret inputs from the keyboard, and initialize the data demultiplexor. (RX 222 at pp. 5-6) In addition, since the purpose of the Mart device was to decode teletext information in different systems, the processing unit had the capability of running different types of teletext software (RX 222 at p. 6). Finally, the display unit contains a page store, a character generator, a display processor, and a time base (RX 222 at pp. 6-7).

602. A person with an ordinary level of skill and experience in the art is a person with a college degree in electrical engineering or computer science and several years of experience in the broadcast or cable television engineering or design field (Ciciora, Tr at 3708-09; Davis, Tr at 3115; Williams, Tr at 309).

603. A prototype of the universal decoder described in the Marti paper was built and demonstrated at a booth for one week at the Eleventh International Television Symposium in Montreux, Switzerland in mid-1979. (B. Marti, Tr at 2097-2100; RX 365; RX 392).

604. Colin Clifford published an article regarding teletext entitled "A Universal Controller For Text Display Systems" in the special issue of IEEE Transactions on Consumer Electronics, Vol. CE-25, no. 3, pp. 424-429 (RX 223), in July 1979, more than a year before the earliest possible effective filing date for the '277 patent. (RX 223).

605. Telesoftware uses the teletext system to transmit software programs to a home computer or an "intelligent" TV. (J. Hedger, RX 174 at 4, 11).

606. The telesoftware system was functional by the time John Hedger published an

article describing the telesoftware system and basic structural elements of the prototype entitled "Telesoftware: Home Computing Via Broadcast Teletext" in IEEE Transactions on Consumer Electronics, Vol. CE-25, No. 3, pp. 279-287 (RX 175), in July 1979, more than a year before the filing date for the '277 patent. (Hedger, RX 174 at 5-6; RX 163; RX 175).

607. Hedger presented his July 1979 article to the 1979 Chicago Spring Conference of the IEEE Transactions on Consumer Electronics. (Hedger, RX 174 at 6).

608. Mr. Hedger and Ron Eason published another article describing the telesoftware system entitled "Telesoftware: Adding Intelligence to Teletext" in the Proceedings of the IEE, pp. 1412-1416 (RX 177) in December 1979, more than a year before the earliest effective filing date for the '277 patent. (Hedger, RX 174 at 7).

609. Hedger presented another paper on teletext to the 1980 Chicago Spring Conference of the IEEE Transactions on Consumer Electronics. This article entitled "Telesoftware — Value Added Teletext" was published in IEEE Transactions on Consumer Electronics, Vol. CE-26, pp. 555-567 (RX 176) in August 1980, more than a year before the earlier effective filing date for the '277 patent. (Hedger, RX 174 at 6, 7; RX 176).

610. At the 1979 and 1980 IEEE conferences there were courtesy suites where teletext systems were demonstrated. These suites were visited by television engineers and representatives of the computing industry. (Crowther, Tr at 1306-1307, 1308, 1308-1309).

611. At the 1980 IEEE conference telesoftware was demonstrated also. (Crowther Tr at 1309).

612. At the 1980 conference, Hedger demonstrated the Telesoftware prototype to the approximately 100 delegates at the conference who were mainly engineers, technicians from the industry, the set making industry, home entertainment, and electronics. (Hedger,

RX 174 at 7, 8).

613. At the demonstration given at the 1980 conference, videotape was used to load the Telesoftware programs into the prototype unit. (Hedger, RX 174 at 8).

614. The videotape demonstrated the functionality of a number of programs which had been described in Hedger's July 1979 paper. (Hedger, RX 174 at 8, 9).

615. Hedger demonstrated the mortgage-calculation telesoftware program hundreds, perhaps thousands, of times. It was one of the more popular programs demonstrated. During his visit to the United States in 1980 alone he demonstrated it several hundred times. (Hedger, Tr at 1873-1874, RX 175 at Fig. 3, § 4; RX 176 at Fig. 3, § 4).

616. Regulations promulgated by the Federal Communications Commission concerning Radio Broadcast Services, and in particular, the vertical blanking interval of the television broadcast signal for captioning for the deaf, appear at 41 Federal Register 56321 through 56326 ("FCC Closed Captioning Regulations"). The publication date of Volume 41 of the Federal Register is December 28, 1976. (RX 219).

617. The FCC Closed Captioning Regulations appear in a printed publication that was published in this country more than one year prior to the November 3, 1981 application date of the '490 patent. (RX 219).

618. U.S. Patent No. 4,310,854 to Baer titled, "Television Captioning System" issued on January 12, 1982 with Sanders Assoc. Inc. as the named assignee ("the Baer patent"). (RX 220).

619. Application Serial No. 69,483, which ultimately issued as the Baer patent, was filed on August 24, 1979. (RX 220).

620. The Baer patent was granted on an application, Serial No. 69,483, that was

filed in the United States before the earliest claimed date of alleged invention by Harvey and Cuddihy. (RX 220).

621. The Marti system discloses the following "structure of the decoder:"

The three main parts of the decoder are:

- the data acquisition unit,
- the processing unit,
- the display unit.

3.1 - The data acquisition unit

The E B U subgroup V2 which is in charge for defining E B U recommendations in data broadcasting agreed, at its last meeting, on transmission standards which simplify the design of a multisystem decoder. The data acquisition unit is composed of three parts:

- the data demodulator receives the video signal with the data inserted in. In the case of "short prefix" systems, it receives from the data demultiplexer an information saying that it must wait for data lines only during the field blanking interval. This provision is absolutely necessary because, with a short prefix, it has been computed (see e.g. (6) or (7)) that the probability to capture at least one program line as data lines during one page transmission is 93% at the rate of 2 data lines per field. Its clock generator is adjusted to one of the values used (presently 6.2 and 6.9MHz).

The techniques used for choosing the tuning frequency are well known as they are already used in R E demodulators.

The output of this demodulator is a stream of demodulated serial data sliced out from the incoming video signal.

- The data demultiplexor receives the data from the demodulator and from the processing unit the following information: the value of the framing word, which indicates also, according to the E B U recommended transmission system, the kind of prefix used; the code of the data channel chosen by the user (3 bytes with the long prefix, 2 bytes for the medium prefix, 1 byte for the shortest one); when the intermediate prefix is used, an indication is necessary to say that it will be a Teletext service and, then the demultiplexor takes account of only 3 bits of the prefix. With the shortest and the longest prefix, the demultiplexor processes a format indication and transmits to the buffer from each data packets either the number of bytes indicated or the

maximum format length if the format byte is received with a double error.

All the service bytes being Hamming protected, the demodulator checks whether they are correctly interpretable or not.

- The buffer is necessary because the instant rate of incoming data is some Mbit/s while the mean rate is some hundred times lower. The decoding unit works at a low speed and needs the incoming data flow being buffered. The capacity of this buffer, for services using only the capacity of a few lines per field may be lower than a hundred byte. But to allow a higher speed (up to the full channel) i.e. 4Mb/s to be used, a capacity of 1kbyte is preferable.

3.2 - The processing unit

The processing unit is a microprocessor with its program in a R O M (or in a R A M).

Its functions are:

- to receive the codes from the buffer,
- interpret them according to a given code table,
- to fill, consequently, the page store,
- to interpret the codes from the keypad,
- to initialize the data demultiplexor as said before.

Three different softwares may be set up:

- the Teletext software,
- The Antiope software with a general part and specific parts for handling either the data from the demultiplexor or from the modem,
- the Viewdata software.

As an example, we will give hereafter a complete description of a possible Teletext software. An Antiope software is very similar and contains in addition a processing for error correction which is out of the topic of this paper, although of a very great interest.

Other softwares may be implemented or loaded from a local memory (cassette or bubble) or from the line (broadcast or telephone). Having simultaneously processing and display capabilities, such a Videotex decoder appears to be more than only that: it is a low cost communicating home terminal. In addition to their present function of providing pages, broadcasters

and service providers of interactive data bases will be asked to provide a new kind of information i.e. software. Programs for Videogames or for home computing may be thus proposed to the users. This new market will have probably a great development.

3.3 - The display unit

The display unit is composed of a page store having, as seen about 16 bits per displayed character, i.e. 16kbits, a character generator, a display processor, and a time base. The time base is able to generate 25 rows which is the smallest common basis between the two systems. The display processor receives the black and white video from the character generator and the information of the attribute bits is loaded at every character time in corresponding latches which are:

- 3 foreground colors,
- 3 background colors,
- 1 flash,
- 1 boxing,
- 1 conceal,
- 1 polarity.

The size (width and height) bits are transmitted to the time base which modify consequently its address generation process. A word of the memory (e.g. word 1001) contains information necessary for the display processor at the page level: television or Videotex mode, conceal or reveal mode.

The character generator must at least contain the union (in the sense of set theory) of the characters used by the Teletext system and of those used by the Antiope system.

In fact the addressing capability of the 16bit word as already defined in 378 different shapes plus the mosaic characters, contiguous as well as separated. It has been shown (8) that, to cover all the requirement of E B U this number is large enough and could cover as well the E B U Latin alphabets, the Greek alphabet and the Yugoslavian Cyrillic alphabets. Alternatively, some of the addressing capability could be reserved to software characters, defined by the source, whose shapes are transmitted on the line and loaded into a R A M part of the character generator.

(RX 222 at 4-7) See also Marti, Tr at 2107 - 2122).

622. Marti testified as follows regarding the disclosure of a signal with a varying location in his paper:

Q I don't want to spend the time to go through all of the elements, but let me ask you, what did you find to be the varying location of the signal based upon which the detection of the data occurs?

A The varying location, if my interpretation of the word "location" is correct, may refer to the various lines of the television signal, some of the lines being devoted to the transport of data and some of the lines being devoted to the transport of image. And, of course, depending for instance on the mode, the VBI mode which identified a certain set of lines or the full field mode which identifies another set of lines, you have different places in the signal if I can use the word place, which I don't like, various locations if you want me to use that in the signal where you have to look for the teletext or data signals.

Q Just so I understand, why don't you like using the word place or location in this context?

A Well, because we are working on a signal and a signal is a time dependent value, not a space dependent value, and the form of the word in Latin location means space. I guess that is also a language you don't know in this court, but location comes from Latin, locus, which means a place.

(Marti, Tr at 2133).

P. Remedy And Bonding

623. James B. Ramo is Executive Vice President of DIRECTV (Ramo RX 118 at 2).

624. At the time of the September 23, 1996 residual agreement between Hitachi and DIRECTV, DIRECTV maintained approximately a 55% market share of all direct broadcasting providers. (Ramo, Tr at 1496:14-18; 1497:23-1498:17; CX 143).

625. DIRECTV has approximately 2.6 million subscribers. (Butterworth, Tr 1461).

626. William Butterworth is one of the executive vice presidents of DIRECTV (Butterworth Tr At 1461).

627. Butterworth testified (Tr at 1461):

Q Okay. Now, I believe you stated in your witness statement that DIRECTV has 2.6 million subscribers. Is that accurate?

A Approximately, yes.

Q And approximately how much, what average number would you allocate to each of those subscribers as a monthly payment?

A Somewhere in the range of \$40 probably, but that is a guess off the top of my head.

Q So, if we were to take \$40 and multiply it by 2.6 million, would that be a rough estimate of how much per month?

A I guess so, yes.

628. In addition to subscription fees, DIRECTV also receives revenue from licensing its DSS trademark to IRD manufacturers. (Butterworth, Tr 1461-63).

629. When DIRECTV was launched in 1994, the average retail price for a high-end IRD was approximately \$899 with the low-end IRD's selling for approximately \$699. (Ramo, Tr 1517).

630. As of July 7, 1997, the average retail price of a high-end DSS IRD was approximately \$299 with the low-end IRD's selling for approximately \$199. (Ramo, Tr 1517).

631. {

}

(Ramo, Tr at 1505:18-1506:16; CX 135).

632. {

} (Ramo, Tr at 1516:12-1517:1).

633. USSB offers subscribers programming packages that range in price from \$34.95-\$7.95 a month, as well as certain promotional packages for less than those amounts. (S. Hubbard, Tr at 1824; RX 121 at 12:12-15).

634. The average USSB subscriber pays "just under" \$25 a month for USSB programming. (S. Hubbard, Tr 1824).

635. As of the end of June, 1997, there were approximately 1,450,000 USSB subscribers. (S. Hubbard, Tr 1841).

636. Stanley E. Hubbard is President and a Director of U.S. Satellite Broadcasting (USSB). (RX 121 at 2).

637. USSB grosses approximately \$36.25 million dollars a month, \$435 million a year, in revenue from subscription fees. (S. Hubbard, Tr 1824, 1841).

638. TCE is the main market share company for DSS receivers (Ramo Tr At 1497).

639. {

}

640. Ramo estimated that either as of July 7, 1997 date of his testimony or the September 26, 1996 date of the DIRECTV and Hitachi agreement, TCE had a 30 percent share of the total DBS market (Ramo Tr At 1496-1498).

641. Sony is second to TCE in market share of DSS IRDs. (Ramo, Tr 1504).

642. {

} (McCabe Dep., CX 325 at 81-82).

643. The FCC issued licenses to Hughes Communications Galaxy and USSB to use and operate Direct Broadcast Satellites. (RX 77; RX 78; RX 122 rev at 11; RX 90).

644. The licenses issued to Hughes Communications Galaxy and USSB by the FCC designate specific orbital positions for the satellites and the channels on which the satellites may operate. (RX 77; RX 78; RX 90).

645. The licenses issued to Hughes Communications Galaxy and USSB by the FCC incorporate technical and performance parameter and further state that they are "[s]ubject to the provisions of the Communications Act of 1934, as amended, subsequent acts and treaties, and all regulations heretofore and hereafter made by this Commission." (RX 77 at DTV-90-4216; RX-78 at DTV-90-4221; RX 90 at USSB-90-0032, at USSB-90-0034).

646. Hughes Communications Galaxy assigned its licenses to DIRECTV with the consent of the FCC. (RX 79).

647. The royalty rate between PMC and Sony which is licensed with respect to all of PMC's issued patents and pending applications, is { } per receiver sold. (CX 12 §§ 2.1, 2.4; Metzger, Tr at 188:14-189:15). Respondents DIRECTV, Inc., United States Satellite Broadcasting Company, Inc., Hughes Network Systems and Hitachi Home Electronics (America), Inc. herein submit their objections and proposed rebuttal findings to the proposed Findings of Fact of Commission Investigative Staff.

648. As of February 23, 1997, TCE had a substantial inventory of imported DSS IRDs, which included boxes manufactured for Toshiba and Matsushita and held in inventory by TCE. (CX 255 at TCE 09000002421-2425; CX 40).

CONCLUSIONS OF LAW

1. The Commission has in rem jurisdiction, subject matter jurisdiction and in personam jurisdiction.
2. There has been an importation of certain digital satellite system (DSS) receivers and components thereof in issue which are the subject of the unfair trade allegation.
3. An industry exists in the United States as required by subsection (a) (2) of section 337 that exploits the '277 patent in issue.
4. Respondents have failed to establish that the '277 patent is unenforceable.
5. Each of the claims in issue is invalid under 35 U.S.C. § 112, first paragraph.
6. Each of the claims in issue is invalid under 35 U.S.C. § 112, second paragraph.
7. Respondents have not established that claim 6 is invalid as anticipated under 35 U.S.C. § 102 or obvious under 35 U.S.C. § 103.
8. Respondents have established that claim 7 is invalid as anticipated under 35 U.S.C. § 102.
9. Respondents have failed to establish that claim 44 is invalid as anticipated under 35 U.S.C. § 102 or obvious under 35 U.S.C. § 103.
10. Complainant has failed to establish that users of the accused DSS receiver infringe each of the claims in issue.
11. Complainant has failed to establish contributory or induced infringement of each of the claims in issue by respondents.
12. Respondents are not in violation of section 337, based on their importation into the United States, sale for importation, and sale within the United States after importation of certain

digital satellite system (DSS) receivers and components thereof.

13. In the event the Commission finds a violation of section 337, it is recommended that a limited exclusion order issue as to accused DDS receivers imported by or on behalf of respondents TCE, HNS, Hitachi, Toshiba, and Matsushita, and cease and desist orders issue directed to TCE, HNS, Hitachi, Toshiba, and Matsushita; DIRECTV, and USSB prohibiting importations and sales after importation of accused DSS receivers and related activities.

14. In the event the Commission finds a violation of section 337, it is recommended that a bond, based upon a reasonable royalty rate, be required during Presidential review.

ORDER

Based on the foregoing findings of fact, conclusions of law, the opinion, and the record as a whole, and having considered all of the pleadings and arguments presented orally and in briefs, as well as certain proposed findings of fact, it is the administrative law judge's final initial determination that there is no violation of section 337 in the importation into the United States, sale for importation, and the sale within the United States after importation of certain digital satellite system (DSS) receivers and components thereof. Based on the foregoing, should the Commission find a violation of section 337, the administrative law judge recommends that a limited exclusion order and certain cease and desist orders should issue and also that a bond based upon a reasonable royalty should be imposed during Presidential review.

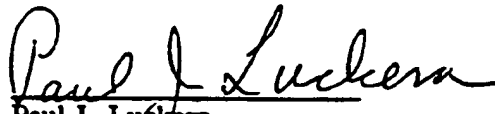
The administrative law judge hereby CERTIFIES to the Commission his final initial and recommended determinations together with the record consisting of the exhibits admitted into evidence. The pleadings of the parties filed with the Secretary and the transcript of the hearing, including closing arguments, are not certified, since they are already in the Commission's possession in accordance with Commission rules.

Further it is ORDERED that:

1. In accordance with Commission rule 210.39, all material heretofore marked in camera because of business, financial, and marketing data found by the administrative law judge to be cognizable as confidential business information under Commission rule 201.6(a) is to be given in camera treatment continuing after the date this investigation is terminated.
2. Counsel for the parties shall have in the hands of the administrative law judge

those portions of the final initial and recommended determinations which contain bracketed confidential business information to be deleted from any public version of said determinations, and all attachments thereto, no later than Wednesday, October 29, 1997. Any such bracketed version shall not be served by telecopy on the administrative law judge. If no such bracketed version is received from a party it will mean that the party has no objection to removing the confidential status, in its entirety, from these initial and recommended determinations.

3. The final initial determination portion of the "Initial and Recommended Determinations," issued pursuant to Commission rule 210.42(h)(2), shall become the determination of the Commission forty-five (45) days after the service thereof, unless the Commission, within forty-five (45) days after the date of such service of the initial determination portion shall have ordered review of that portion or certain issues therein or by order has changed the effective date of the initial determination portion. The recommended determination portion, issued pursuant to Commission rule 210.42(a)(1)(ii), will be considered by the Commission in reaching a determination on remedy and bonding pursuant to Commission rule 210.50(a).


Paul J. Luckern
Administrative Law Judge


Issued: October 20, 1997

**CERTAIN DIGITAL SATELLITE SYSTEM (DSS)
RECEIVERS AND COMPONENTS THEREOF**

Inv. No. 337-TA-392

CERTIFICATE OF SERVICE

I, Donna R. Koehnke, hereby certify that the attached Public Initial Determination was served by hand upon Smith R. Brittingham, IV, Esq., and upon the following parties via first class mail, and air mail where necessary, on October 31, 1997.


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**CERTAIN DIGITAL SATELLITE SYSTEM (DDS)
RECEIVERS AND COMPONENTS THEREOF**

Inv. No. 337-TA-392

CERTIFICATE OF SERVICE - p. 2

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**CERTAIN DIGITAL SATELLITE SYSTEM (DDS)
RECEIVERS AND COMPONENTS THEREOF**

Inv. No. 337-TA-392

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(PARTIES NEED NOT SERVE COPIES ON LEXIS OR WEST PUBLISHING)

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